ORDER NO. ARD-7906043C

Service Manual

Cassette Deck

RS-M63

(Silver Face
Black Face)

3-Head Stereo Cassette Deck with Metal Tape Selector,
2-Color FL Peak Meters and Memory Auto-Play

DOLBY SYSTEM

This is the Service Manual for the following areas.

- [D] ····· For All European areas except United Kingdom.
- [B] ····· For United Kingdom.
- [N] ····· For Asia, Latin America, Middle East and Africa areas.
- [A] ····· For Australia.

RS-631 MECHANISM SERIES

Specifications

Track system:	4-track 2-channel stereo recording and playback
Tape speed:	4.8 cm/s
Wow and flutter:	0.05% (WRMS), ±0.14% (DIN)
Frequency response:	Metal tape; 20 – 20,000 Hz 30 – 18,000 Hz (DIN) 30 – 17,000 Hz ±3 dB (0 VU) 40 – 13,000 Hz ±3 dB CrO_2/Fe-Cr tape; 20 – 18,000 Hz 30 – 18,000 Hz (DIN) 30 – 16,000 Hz ±3 dB Normal tape; 20 – 18,000 Hz 30 – 17,000 Hz (DIN) 30 – 15,000 Hz ±3 dB
Signal-to-noise ratio:	Dolby* NR in; 67 dB (above 5 kHz) Dolby NR out; 57 dB (signal level = max. recording level, Fe-Cr/CrO_2 type tape)
Fast forward and rewind time:	Approx. 90 seconds with C-60 cassette tape
Inputs:	MIC; sensitivity 0.25 mV, input impedance 10 kΩ applicable microphone impedance 40 Ω – 10 kΩ LINE; sensitivity 60 mV, input impedance 56 kΩ
Outputs:	LINE; output level 650 mV, output impedance 2.7 kΩ or less, load impedance 22 kΩ over HEADPHONE; output level 100 mV, load impedance 8 Ω
Rec/pb connection:	5 P DIN type; input sensitivity 0.25 mV impedance 8.2 kΩ, output level 650 mV, impedance 2.8 kΩ
Bias frequency:	85 kHz
Motor:	Electronically controlled DC motor
Heads:	3-head system; 2-HPF heads for record/playback (combination type) 1-sendust/ferrite double-gap head for erasure
Power requirement:	AC; 110/125/220/240 V, 50-60 Hz Power consumption; 14 W
Dimensions:	43.0 cm (W) × 14.2 cm (H) × 27.0 cm (D)
Weight:	6.3 kg

Specifications are subject to change without notice.

* 'Dolby' and the double-D symbol are trademarks of Dolby Laboratories.

Technics

Matsushita Electric Trading Co., Ltd.
P.O. Box 288, Central Osaka Japan

LOCATION OF CONTROLS AND COMPONENTS

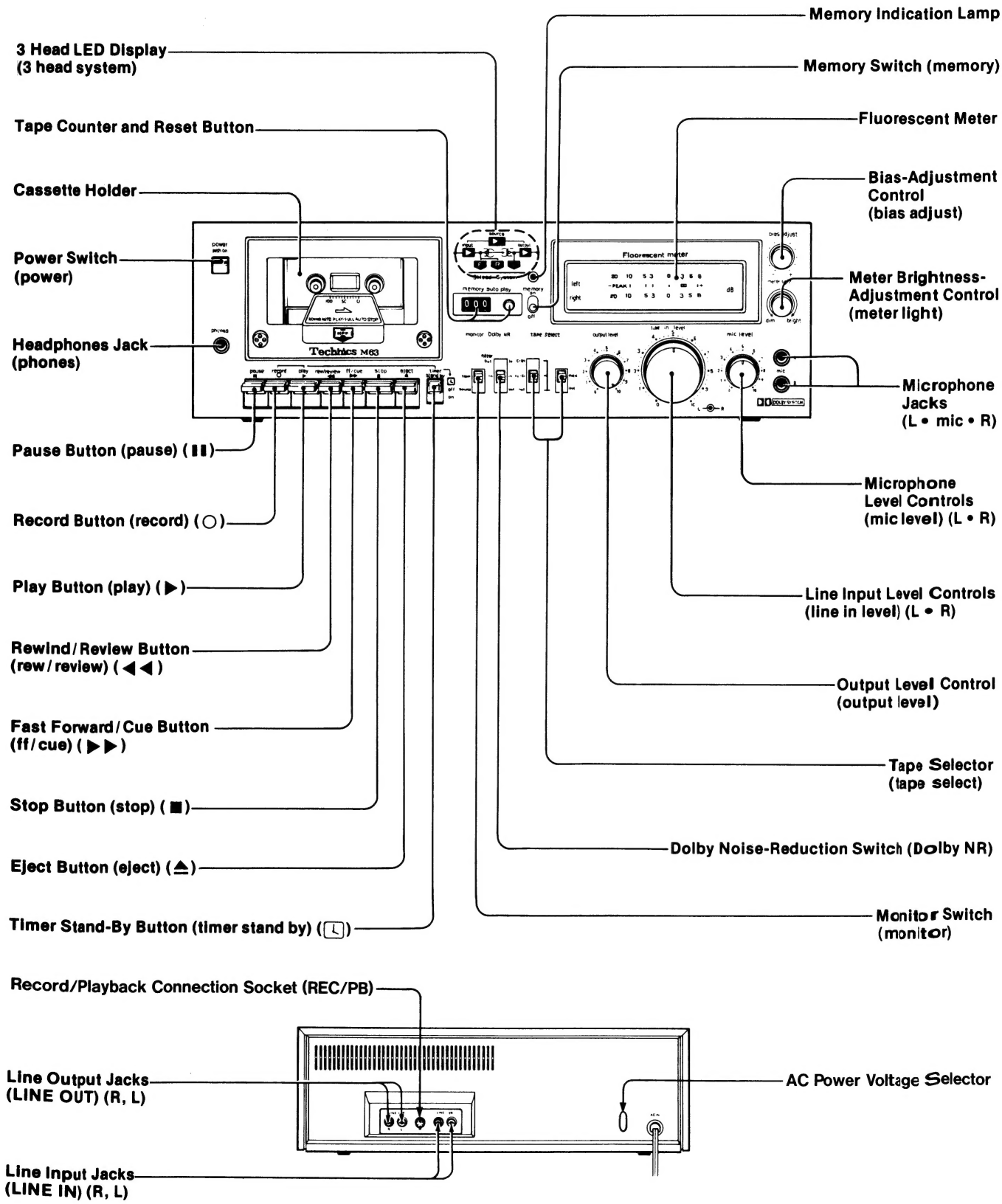


Fig. 1

RS-M63 FRANCAIS

MESURES ET REGLGES

NOTA:

1. Vérifiez que les têtes soiènt propres.
2. Vérifiez que le cabestan et le galet-pressure soient propres.
3. Température ambiante admissible: 20±5°C.
4. Sélecteur de Dolby:
5. Sélecteur de bande: Normal.
6. Commande de réglage de la polarisation: Centre.
7. Commande de la luminance du voltmètre: Centre.
8. Commutateur de contrôle: Position bande.

SECTION	MESURES ET REGLAGES
Ⓐ Azimutage de tête Condition: * Position lecture Equipement: * Voltmètre électronique * Oscilloscope * Bande étalon (Fenêtre de passage de la bande avec mirroir.) ...QZZCRD * Bande étalon (Azimutage)...QZZCFM	**Réglage de la tête multiple** 1. Branchez les appareils comme ci-dessous. (Fig. 8). 2. Lisez la bande étalon (QZZCRD). 3. Ces conditions étant remplies, réglez les vis (A) et (B) montrés à la fig. 9 et 11 pour que la bande ne fasse pas de boucle ou ne se déforme par les guides-bandes de la tête d'effacement et de la tête multiple. (la fig. 10 montre la position correcte). **Nota:** En ce qui concerne la tête multiple, réglez soigneusement la hauteur de manière à ce que la surface de la tête se mette en contact parallèlement avec la bande comme il est montré à la fig. 11. 4. Lisez la bande étalon d'azimutage (QZZCFM, 8kHz). 5. Réglez la vis (C) d'orientation fig. 9 de la tête multiple pour obtenir le niveau maximal à la sortie LINE OUT. 6. Mesurez les deux canaux, et ajustez les niveaux à égalite de tension de sortie. 7. Après réglage, bloquez la vis par une goutte de vernis.
Ⓑ Vitesse de éfilement Condition: * Position lecture Equipement: * Compteur électronique numérique ou fréquencemètre numérique * Bande étalon...QZZCWAT	**Précision de la vitesse de éfilement** 1. Branchez les appareils comme ci-dessous. (Voir fig. 8). 2. Lisez la bande étalon (QZZCWAT, 3000Hz) et appliquez le signal de sortie au fréquencemtre. 3. Mesurez sa fréquence. 4. Surla base de 3000Hz, déteminez la valeur à l'aide de la formule. Précision de vitesse = $(\frac{f-3000}{3000}\times 100)\%$ avec f = valeur mesurée. 5. Effectuez la mesure sur la partie médiane de la bande. **Valeur normale: ±1,5%** **Méthode de réglage** 1. Lisez la bande étalon (milieu). 2. Ajustez la vis de réglage de vitesse VR indiquée fig. 29 pour que la fréquence devienne égale à 3000Hz. **Fluctuations de vitesse de défilement** Faites les mesures de la même façon que ci-dessus (au début, au milieu et en fin de bande) et déterminez la différence entre les valeurs maximale et minimale, puis calculez comme suit. Fluctuations de vitesse = $(\frac{f_1-f_2}{3000}\times 100)\%$ f_1 = valeur maximal f_2 = valeur minimale **Valeur normale: 1%**

SECTION	MESURES ET REGLAGES
Ⓒ Réponse en fréquence à la lecture Condition: * Position lecture Equipement: * Voltmètre électronique * Oscilloscope * Bande étalon...QZZCFM	1. Branchez les appareils de mesure comme pour "l'azimutage de tête", mais en utilisant la bande étalo (QZZCFM) au lieu de la bande étalon d'azimutage (voir fig. 8). 2. Placez l'appareil en position lecture. 3. Lisez la bande étalon de courbe de réponse (QZZCFM). 4. Mesurez les niveaux de sortie à 10kHz, 8kHz, 4kHz, 1kHz, 315Hz 250Hz, 125Hz et 63Hz comparez chaque niveau de sortie avec celui de la fréquence étalon de 333Hz, sur la borne LINE OUT. 5. Effectuez la mesure sur les deux canaux. 6. Vérifiez que les valeurs mesurées se situent à l'intérieur du gabarit de courbe de réponse. **Réglage** Si les valeurs ne sont pas correctes, réglez VR1 (canal gauche) et VR2 (droit) (voir fig. 29). 1. A 4kHz: Si le niveau de sortie à 4kHz n'est pas égale au niveau de sortie à 315Hz, réglez le VR1 (canal gauche) et le VR2 (canal droit). 2. Bande de haute fréquence: Si la valeur mesurée n'est pas standard dans une bande de haute fréquence comme montré à la fig. 13, changez les points de soudure comme il est indiqué dans les exemples suivants: a. Quand le niveau de sortie diminue comme indique fig. 14, souder le point de jonction (B) sur la plaquette de circuit imprimé. (Voir fig. 16). b. Quand le niveau de sortie augmente comme indiqué fig. 15, dessouder le point de jonction (A) sur la plaquette de circuit imprimé. (Voir fig. 16).
Ⓓ Gain à la lecture Condition: * Position lecture * Commande de niveau de sorite...MAX Equipement: * Voltmètre électronique * Oscilloscope * Bande éltalon...QZZCFM	1. Branchez les appareils selon la fig. 8. 2. Lisez la partie "niveau standard" de la bande étalon (QZZCFM, 315Hz) et mesurez le niveau de sortie, avec le voltmètre électronique, sur le jack LINE OUT. 3. Effectuez les mesures sur les deux canaux. **Valeur normale: 0,65V** **Réglage** 1. Si la valeur mesurée n'est pas correct, réglez VR3 (canal gauche) et VR4 (droit) (Voir fig. 28). 2. Après réglage, vérifiez à nouveau la "réponse en fréquence à la lecture".
Ⓔ Courant d'enregistrement Condition: * Position lecture Equipement: * Voltmètre électronique * Oscilloscope * Générateur AF * Atténuateur	1. Branchez les appareils comme ci-dessous (Voir fig. 17). 2. Arrêtez les oscillations de polarisation en dessoudant le point de jonction (C) pour le courant de polarisation ON ou OFF comme indiqué fig. 16. 3. Alimenter d'un kHz (−24dB) et réglez le ATT de telle façon que le niveau de contrôle à la "LINE OUT" devienne 0,65V. 4. Mesurez le voltage et calculez alors le courant d'enregistrement par la formule donnée ci-dessous: Courant d'enregistrement = $\frac{\text{Tension lue sur voltm. élec (V)}}{10(\Omega)}$ **Valeur normale: Autour de 230μA (position Metal), Autour de 180μA (position CrO_2), Autour de 150μA (position Fe-Cr), Autour de 150μA (position Normal)** 5. Si la valeur mesurée n'est pas correct, réglez les VR suivants: Position Metal ...VR205 (L-CH), VR206 (R-CH) Position CrO_2.....VR207 (L-CH), VR208 (R-CH) Position Fe-Cr ...VR209 (L-CH), VR210 (R-CH) Position Normal...VR211 (L-CH), VR212 (R-CH)

SECTION	MESURES ET REGLA
Ⓕ Fuites de Prémagnétisation Condition: * Position enregistrement * Commandes de niveau MIC et LINE IN...MAX Equipement: * Voltmètre électronique * Oscilloscope	1. Branchez les appareils comme ci-dess 2. Placez l'appareil en position enregistre 3. Réglez les bobines de la trappe L207 ((droit) pour que la mesure soit au minir 4. Effectuez ce réglage pour les deux can
Ⓖ Courant d'effacement Condition: * Position enregistrement Equipement: * Voltmètre électronique * Oscilloscope	1. Branchez les appareils comme ci-dess 2. Lire le voltage sur le VTVM et détermin ment suivant la formule suivante. Courant d'effacement (A) = Tension aux bornes de la résis 1(Ω) **Valeur normale: Plus de 95mA (po plus de 68mA (po plus de 55mA (po plus de 45mA (po** 3. Si la valeur mesurée n'est pas correct, Position Metal ...VR407 Position CrO_2.....VR406 Position Fe-Cr ...VR405 Position Normal...VR404
Ⓗ Courant de prémagnétisation Condition: * Position enregistrement * Lorsquón règle le courant de prémagnétisation pour un seul canal; le courant de láutre peut varier. * Commande de réglage de la polarisation: centre Equipement: * Voltmètre électronique * Oscilloscope	1. Branchez les appareils comme ci-dess 2. Placez l'appareil en position enregistre bande sur "normal" (pour bande norma 3. Lisez la tension sur le voltmètre électr courant de prémagnétisation selon la f Courant de prémagnétisation (A) = Tension lue sur voltm. 10(Ω) **Valeur normale: Autour de 2,2mA Autour de 1,6mA Autour de 1,3mA Autour de 1,1mA** 4. Réglez VR401 canal gauche et VR402 (
Ⓘ Gain global Condition: * Positions enregistrement/lecture * Commande de niveau LINE IN...MAX * Commande de niveau de Sortie...MAX * Niveaux d'entrée normaux MIC −72±4dB LINE IN −24±3dB DIN −41±3dB Equipement: * Générateur AF * Voltmètre électronique * Atténuateur * Oscilloscope * Bande étalon vierge ...QZZCRA pour type de bande normale ...QZZCRX pour CrO_2 ...QZZCRY pour Fe-Cr ...QZZCRZ pour Metal	1. Branchez les appareils comme sur la f 2. Appliquez un signal à 1kHz (−24dB) du vers l'atténuateur, à l'entrée LINE IN. 3. Réglez l'atténuateur pour que le niveau sur LINE OUT soit de 0,65V. 4. Faites un enregistrement avec la band 5. Lisez la bande ainsi enregistrée, et vér sur le voltmètre électronique branché s de 0,65V. 6. Si la valeur mesurée n'est pas correct, Position Metal ...VR205 (L-CH), VR206 Position CrO_2.....VR207 (L-CH), VR208 Position Fe-Cr ...VR209 (L-CH), VR21(Position Normal...VR211 (L-CH), VR212 7. Recommencez à partir du palier (2).

	MESURES ET REGLAGES
	1. Branchez les appareils comme ci-dessous (voir fig. 18). 2. Placez l'appareil en position enregistrement. 3. Réglez les bobines de la trappe L207 (canal gauche) et L208 (droit) pour que la mesure soit au minimum. 4. Effectuez ce réglage pour les deux canaux.
	1. Branchez les appareils comme ci-dessous (voir fig. 19). 2. Lire le voltage sur le VTVM et déterminer la tension d'effacement suivant la formule suivante. Courant d'effacement (A) = $\frac{\text{Tension aux bornes de la résistance } 1\Omega \text{ (V)}}{1(\Omega)}$ **Valeur normale:** **Plus de 95mA (position Metal)**, **plus de 68mA (position CrO_2)**, **plus de 55mA (position Fe-Cr)**, **plus de 45mA (position Normal)** 3. Si la valeur mesurée n'est pas correct, réglez les VR suivants: Position Metal ...VR407 Position CrO_2.....VR406 Position Fe-Cr ...VR405 Position Normal...VR404
	1. Branchez les appareils comme ci-dessous (voir fig. 20). 2. Placez l'appareil en position enregistrement, le sélecteur de bande sur "normal" (pour bande normale). 3. Lisez la tension sur le voltmètre électronique et calculez le courant de prémagnétisation selon la formule. Courant de prémagnétisation (A) = $\frac{\text{Tension lue sur voltm. élec. (V)}}{10(\Omega)}$ **Valeur normale:** **Autour de 2,2mA (position Metal)**, **Autour de 1,6mA (position CrO_2)**, **Autour de 1,3mA (position Fe-Cr)**, **Autour de 1,1mA (position Normale)** 4. Réglez VR401 canal gauche et VR402 (canal droit).
	1. Branchez les appareils comme sur la fig. 21. 2. Appliquez un signal à 1kHz (–24dB) du générateur AF, à travers l'atténuateur, à l'entrée LINE IN. 3. Réglez l'atténuateur pour que le niveau d'écoute simultanée sur LINE OUT soit de 0,65V. 4. Faites un enregistrement avec la bande étalon. 5. Lisez la bande ainsi enregistrée, et vérifiez que la valeur lue sur le voltmètre électronique branché sur LINE OUT est bien de 0,65V. 6. Si la valeur mesurée n'est pas correct, réglez les VR suivants: Position Metal ...VR205 (L-CH), VR206 (R-CH) Position CrO_2.....VR207 (L-CH), VR208 (R-CH) Position Fe-Cr ...VR209 (L-CH), VR210 (R-CH) Position Normal...VR211 (L-CH), VR212 (R-CH) 7. Recommencez à partir du palier (2).

SECTION	MESURES ET REGLAGES
J Indicateur de niveau Condition: * Position enregistrement * Commande de niveau ...MAX * Commande de niveau de sortie...MAX * Selecteur de band ...position basse Equipement: * Voltmètre électronique * Oscilloscope * Générateur AF * Atténuateur * Commutateur de contrôle ...Position Source	1. Branchez les appareils comme sur la fig. 21. 2. Placez sélecteur Brightness sur "BRIGHT" position. 3. Alimenter d'un KHz (–24dB) a la fiche "LINE IN", puis pousser le bouton d'enregistrement. 4. Régler le ATT de telle façon à ce que le niveau de sortie à la fiche "LINE OUT" devienne 0,65V (= niveau de sortie standard). 5. Réglage au "0dB". A. Régler VR103 (L-CH) et VR104 (R-CH) de telle manière à ce que le compteur métrique fluorescent marque une indication lumineuse jusqu'à "0dB" lorsque le niveau d'entrée est de 0,9dB plus haut que le niveau d'entrée standard. B. S'assurer ensuite que le compteur métrique marque une indication lumineuse jusqu'á "+1dB" lorsque le signal du niveau d'entrée est plus haut de 1,0dB que le niveau d'entrée standard. 6. Réglage au "–20dB". A. Régler VR101 (L-CH) et VR102 (R-CH) de telle facon à ce que le compteur fluorescent marque une indication lumineuse jusqu'à "–20dB" lorsque le signal du niveau d'entrée est de 15,1dB plus bas que le niveau d'entrée standard. B. S'assurer ensuite que le compteur fluorescent marque une indication lumineuse jusqu'à"–15dB" lorque le signal du niveau d'entrée est de 15,0dB plus bas que le niveau d'entrée standard.
K Courbe de réponse globale Condition: * Positions enregistrement/ lecture * Commande de niveau ...MAX * Commande de niveau de sortie...MAX Equipement: * Voltmètre électronique * Générateur AF * Atténuateur * Bande étalon vierge ...QZZCRA pour type normal ...QZZCRX pour CrO_2 ...QZZCRY pour Fe-Cr ...QZZCRZ pour Metal	**Nota:** Avant de mesurer et régler, vérifiez que la courbe de réponse en lecture est correct (pour la méthode de mesure, reportez-vous au paragraph considéré). 1. Branchez les appareils de mesure comme surla fig. 21. 2. Mettez la bande vierge étalon en place et placez l'appareil en position enregistrement. 3. Appliquez un signal à 1kHz du générateur AF, à travers l'atténuateur, à l'entrée LINE IN. 4. Réglez l'atténuateur pour que le niveau d'entrée soit inférieur de –20dB au niveau étalon d'enregistrement (qui est égal à 0VU). 5. A ce moment, le niveau sur LINE OUT est de 0,065V. 6. Enregistrez les fréquences de 50Hz, 100Hz, 200Hz, 1kHz, 2kHz, 4kHz, 8kHz, 10kHz et 13kHz (15kHz pour bande Metal/ bande CrO_2/bande FeCr) à niveau constant. 7. Lisez cet enregistrement et exprimez en dB les différences entre le niveau de sortie de chaque fréquence et le niveau à 1kHz. 8. Vérifiez que les valeurs mesurées s'inscrivent bien à l'intérieur du gabarit de courbe de réponse global. 9. Mettre le sélecteur de polarisation et de compensation en position Metal, CrO_2 et Fe-Cr. 10. Effectuez les mesures comme ci-dessus. 11. Vérifiez que les valeurs mesurées s'inscrivent bien à l'intérieur du gabarit de courbe de réponse globale avec bande au Metal, CrO_2 et Fe-Cr ci-dessous (voir fig. 25).
L Courbe de réponse giobale (méthode normale de réglage)	1. Lorsque la courbe de réponse dépasse le gabarit entre le médium et l'aigu, comme indiqué par le trait plein de la fig. 26, augmentez le courant de prémagnétisation en tournant les VR suivants. Position Metal...VR407, Position CrO_2.....VR406, Position Fe-Cr...VR405, Position Normal...VR404. 2. Lorsqu'elle est inférieure, comme indiqué par la ligne en trait interrompu, réduisez le courant de prémagnétisation en tournant les VR suivants en sens inverse. Position Metal...VR407, Position CrO_2.....VR406, Position Fe-Cr...VR405, Position Normal...VR404.

SECTION	MESURES ET REGLAGES
	Nota: 1. Pour les réglages avec un courant de prémagnétisation inférieur à la valeur normale de 0,17mA, utilisez la seconde méthode, car une réduction du courant de prémagnétisation au-dessous de cette valeur risque de détériorer le taux de distorsion. 2. Pour la mesure du courant de prémagnétisation, reportez-vous au paragraphe correspondant. **Réglage 2—Utilisation des bobines de corection d'enregistrement** 1. Lorsque la courbe de réponse est plate dans le médium et croit ou chute fortement dans l'aigu, comme indiqué par la Fig. 27, réglez en tournant les bobines suivants de correction d'enregistrement avec les bandes normales. Position Metal Position CrO_2.....L205 (L-CH), L206 (R-CH) Position Fe-Cr Position Normal.....L203 (L-CH), L204 (R-CH)
M Circuit Dolby Condition: * Positio enregistrement * Commande de niveau LINE IN...MAX Equipement: * Voltmètre électronique * Générateur AF * Atténuateur * Oscilloscope	1. Placez l'appareil en position enregistrement et le sélecteur Dolby en position OUT, puis appliquez un signal à 5kHz à l'entrée LINE IN pour obtenir –35dB sur TP5 (canal gauche) et TP6 (droit). 2. Vérifiez que la valeur en position IN du sélecteur Dolby augmente de 8 (±1) dB par rapport à celle obtenue en position OUT.

RS-M63 DEUTSCH

Messungen und Einstellung

Anm.:

1. Für saubere Köpfe sorgen.
2. Für saubere Tonwelle und Andruckrolle sorgen.
3. Auf normale Raumtemperatur achten: 20±5°C.
4. Dolby-Schalter: Aus.
5. Band Schalter: Normal.
6. Vormagnetisierungsregler: Zentrum.
7. Meterhelligkeits-Regler: Zentrum.
8. Monitorschalter: Band-Position.

Gegenstand	Messung und Einstellung
Ⓐ Senkrechtstellen des Kopfes Bedingung: * Wiedergabe Meßgerät: * Röhrenvoltmeter * Oszillograf * Testband (azimuth) ...QZZCFM * Testband (Bandlaufweg-Betrachtungsvorrichtung mit Spiegel)...QZZCRD	1. Den Meßaufbau zeigt Fig. 8. 2. Testband (QZZCRD) wiedergeben. 3. In diesem Zustand die Schrauben (A) und (B) in Fig. 9 und 11 so einstellen, daß das Band nicht gekräuselt oder durch die Bandführungen des Löschkopfes und des Kombinationskopfes verformt werden kann. (Fig. 10 zeigt den korrekten Zustand.) **Anm.:** Die Höhe des Löschkopfes sorgfältig abgleichen, daß die Kopfoberfläche das Band parallel berührt, wie in Fig. 11 gezeigt. 4. Testband (QZZCFM, 8kHz) wiedergeben. 5. einstellschraube (C) (Fig. 8) auf maximale Ausgangsspannung einstellen. 6. Beide Kanäle überprüfen und auf gleiche Ausgangsspannung einstellen. 7. Nach dem Abgleich Einstellschraube mit Lack sichern.
Ⓑ Bandgeschwindigkeit Bedingung: * Wiedergabe Meßgerät: * Elektronischer Digitalzähler * Testband...QZZCWAT	**Genauigkeit der Bandgeschwindigkeit** 1. Den Meßaufbau zeigt Fig. 12. 2. Testband (QZZCWAT 3000Hz) wiedergeben und Ausgangssignal dem Zähler zuführen. 3. Frequenz messen. 4. Beträgt die auf dem Testband aufgezeichnete Frequenz 3000Hz, so ergibt sich die Genauigkeit nach folgender Formel: Genauigkeit der Bandeschwindigkeit = $= \frac{f-3000}{3000} \times 100(\%)$ worin f die gemessene Frequenz ist. 5. Die Messung soll im mittleren Teil des Bandes erfolgen. **NORMALWERT: ±1,5%** **Einstellung:** 1. Den mittleren Teil des Testbandes wiedergeben. 2. Die Einstellschraube VR (Fig. 29) so verstellen, daß eine Frequenz von 3000Hz angezeigt wird. **Schwankung der Bandgeschwindigkeit:** Messung, wie oben beschrieben, für Anfang, mittleren Teil und Ende des Testbandes wiederholen und Schwankung wie folgt bestimmen: $\text{Schwankung} = \frac{f_1-f_2}{3000} \times 100(\%)$ f_1 = Maximalwert f_2 = Minimalwert **NORMALWERT: 1%**

Gegenstand	Messung und Einstellung
Ⓒ Frequenzgang bei Wiedergabe Bedingung: * Wiedergabe Meßgerät: * Röhrenvoltmeter * Oszillograf * Testband...QZZCFM	1. Den Meßaufbau zeigt Fig. 8, jedoch ist jetzt das Testband QZZCFM zu verwenden. 2. Gerät auf "Wiedergabe" schalten. 3. Frequenzgang-Testband QZZCFM wiedergeben. 4. Ausgangsspannungen bei 10kHz, 8kHz, 4kHz, 1kHz, 315Hz, 250Hz, 125Hz und 63Hz mit Ausgangsspannung der Standard-Frequenz 315Hz vergleichen. 5. Messungen an beiden Kanälen durchführen. 6. Prüfen, ob die Werte innerhalb der in Fig. 13 dargestellten Kurven lieqen. **Einstellung:** 1. Bei 4kHz: Falls der gemessene Ausgangspegel bei 4kHz nicht dem Ausgangspegel bei 315Hz entspricht, VR1 (Linker Kanal) und VR2 (rechter Kanal) abgleichen. 2. Bei Hochfrequenzbereich: Falls der gemerssene Wert beim Hochfrequenzbereich nicht innerhalb des Richtwertes liegt (in Fig. 13 gezeigt), die Lötstelle gemäß folgenden Beispielen ändern. a. Wenn der Ausgangspegel reduziert wird, wie in Fig. 14 gezeigt, die Anschlußstelle (B) auf der gedruckten Schaltung löten. (Voir fig. 16) b. Wenn der Ausgangspegel gesteigert wird, wie in Fig. 15 gezeigt, die Anschlußstelle (A) auf der gedruckten Schaltung loslöten. (Voir fig. 16)
Ⓓ Wiedergabe-Verstärkung Bedingung: * Wiedergabe Meßgerät: * Röhrenvoltmeter * Oszillograf * Testband...QZZCFM	1. Den Meßaufbau zeigt Fig. 8. 2. Standard-Frequenz (315Hz) vom Testband wiedergeben und Ausgangsspannung messen. 3. Messung an beiden Kanälen durchführen. **NORMALWERT: 0,65V** **Einstellung:** 1. Abweichungen können durch Abgleich von VR3 (linker Kanal) und VR4 (rechter Kanal) (S. Fig. 28) korrigiert werden. 2. Nach effolgtem Abgleich ist der Frequenzgang bei Wiedergabe erneut zu kontrollieren.
Ⓔ Aufnahmestrom Bedingung: * Aufnahme Meßgerät: * Röhrenvoltmeter * NF-Generator * Abschwächer	1. Den Meßaufbau zeigt Fig. 17 2. Vormagnetisierung durch Loslöten der Anschlußstelle (C) für Vormagnetisierungsstrom ON oder OFF in Fig. 16. 3. 1kHz-Signal (−24dB) zuführen und ATT abgleichen, bis Monitorpegel an LINE OUT 0,65V ist. 4. Spannung messen und dann Aufnahmestrom nach folgender Formel berechnen. $\text{Aufnahmestrom} = \frac{\text{Spannung am Röhrenvoltmeter (V)}}{10\ (\text{Ohm})}$ **NORMALWERT:** **Ungefähr 230μA (Metal position)** **Ungefähr 180μA (CrO_2 position)** **Ungefähr 150μA (Fe-Cr position)** **Ungefähr 150μA (Normal position)** 5. Falls der gemessene Wert nicht der Toleranz liegt, die folgenden VR abgleichen. Metal position ...VR205 (L-CH), VR206 (R-CH) CrO_2 position .....VR207 (L-CH), VR208 (R-CH) Fe-Cr position ...VR209 (L-CH), VR210 (R-CH) Normal position...VR211 (L-CH), VR212 (R-CH)

Gegenstand	Messung und
Ⓕ Störstrahlung der Vormagnetisierung Bedingung: * Aufnahme Meßgerät: * Elekeronisches Voltmeter * Oszilloskop	1. Die Verbindnngen des Prüfaufb gegeben. 2. Gerät auf Aufnahme schalten. 3. Sperrkreisspulen L207 (L-CH, Li rechter kanal) so abgleichen, da 4. Beide kanäle abgleichen.
Ⓖ Löschstrom Bedingung: * Aufnahme Meßgerät: * Röhrenvoltmeter * Oszillograf	1. Den Meßaufbauf zeigt Fig. 19 2. Spannung am Röhrenvoltmeter mäß folgender Formel berechne Löschstrom (A) = $= \frac{\text{Spannung über dem}}{1\ (\text{Ohm}}$ **NORMALWERT:** **Größe** **Grßer** **Größe** **Größe** 3. Falls der gemessene Wert nicht den VR abgleichen. Metal position...VR407, CrO_2 po Fe-Cr position...VR405, Normal
Ⓗ Vormagnetisierung * Bedingung: * Vormagnetisierungsregler: Zentrum * Aufnahme * Wenn die Vormagnetisierung eines Kanals eingestellt ist, kann die des anderen durchaus abweichend sein. Meßgerät: * Röhrenvoltmeter * Oszillograf	1. Den Meßaufbau zeigt Fig. 20. 2. Gerät auf "Aufnahme" und Ban schalten. 3. Spannung vom Röhrenvoltmeter rungsstrom nach folgender Forr Vormagnetisierungsstrom ($= \frac{\text{Spannung am Röhre}}{10\ (\text{Ohm})}$ **NORMALWERT:** **Ungef** **Ungef** **Ungef** **Ungef** 4. VR401 (linker Kanal) und VR402 Fig. 28).
Ⓘ Gesamt-Verstärkung Bedingung: * Aufnahme und Wiedergabe * NF-Eingangsregler...Max. * Eingangswahlschalter ...NF-Eingang * Standard-Eingangspergel Mikrofon −72±4dB NF-Eingang −24±3dB DIN −41±3dB Meßgerät: * NF-Generator * Röhrenvoltmeter * Abschwächer * Oszillograf * Testband (Leerband) QZZCRA für Normal QZZCRX für CrO_2 QZZCRY für Fe-Cr QZZCRZ für Metal	1. Den Meßaufbauzeigt Fig. 21. 2. Über den Abschwächer 1kHz au dem NF-Eingang zuführen. 3. Den Abschwächer so einstellen, stehen. 4. Dieses Signal auf Testband aufr 5. Diese Aufnahme wiedergeben u 0,65V stehen. 6. Falls der gemessene Wert nicht den VR abgleichen. Metal position ...VR205 (L-CH), CrO_2 position .....VR207 (L-CH), Fe-Cr position ...VR209 (L-CH), Normal position...VR211 (L-CH), 7. Ab Punkt 2 wiederholen.

	Messung und Einstellung
	1. Die Verbindnngen des Prüfaufbaus sind nachstehend Wiedergegeben. 2. Gerät auf Aufnahme schalten. 3. Sperrkreisspulen L207 (L-CH, Linker Kanal) und L208 (R-CH, rechter kanal) so abgleichen, daß der Meßwert minimal wird. 4. Beide kanäle abgleichen.
	1. Den Meßaufbauf zeigt Fig. 19 2. Spannung am Röhrenvoltmeter ablesen und Löschstrom gemäß folgender Formel berechnen. Löschstrom (A) = $= \frac{\text{Spannung über dem Widerstand (V)}}{\text{1 (Ohm)}}$ **NORMALWERT:** **Größer als 95mA (Metal position)** **Grßer als 68mA (CrO_2 position)** **Größer als 55mA (Fe-Cr position)** **Größer als 45mA (Normal position)** 3. Falls der gemessene Wert nicht der Toleranz liegt, die folgenden VR abgleichen. Metal position...VR407, CrO_2 position .....VR406, Fe-Cr position...VR405, Normal position...VR404.
	1. Den Meßaufbau zeigt Fig. 20. 2. Gerät auf "Aufnahme" und Bandwahlschalter auf "Normal" schalten. 3. Spannung vom Röhrenvoltmeter ablesen und Vormagnetisierungsstrom nach folgender Formel berechnen: Vormagnetisierungsstrom (A) = $= \frac{\text{Spannung am Röhrenvoltmeter (V)}}{\text{10 (Ohm)}}$ **NORMALWERT:** **Ungefähr 2.2mA (Metal position),** **Ungefähr 1.6mA (CrO_2 position),** **Ungefähr 1.3mA (Fe-Cr position),** **Ungefähr 1.1mA (Normal position).** 4. VR401 (linker Kanal) und VR402 (rechter Kanal) abgleichen (S. Fig. 28).
	1. Den Meßaufbauzeigt Fig. 21. 2. Über den Abschwächer 1kHz aus dem NF-Generator (−24dB) dem NF-Eingang zuführen. 3. Den Abschwächer so einstellen, daß am NF-Ausgang 0,65V stehen. 4. Dieses Signal auf Testband aufnehmen. 5. Diese Aufnahme wiedergeben und prüfen, ob am NF-Ausgang 0,65V stehen. 6. Falls der gemessene Wert nicht der Toleranz liegt, die folgenden VR abgleichen. Metal position ...VR205 (L-CH), VR206 (R-CH) CrO_2 position .....VR207 (L-CH), VR208 (R-CH) Fe-Cr position ...VR209 (L-CH), VR210 (R-CH) Normal position...VR211 (L-CH), VR212 (R-CH) 7. Ab Punkt 2 wiederholen.

Gegenstand	Messung und Einstellung
Ⓙ Fluorezenzmeter Bedingung * Aufnahme * Eingangsregler...Max. * Bandwahlschalter ...Normalstellung * Ausgangsregler...Max. * Monitorschalter ...Source-Position Meßgerät: * Röhrenvoltmeter * Oszillograf * NF-Generator * Abschwächer	1. Den Meßaufban zeigt Fig. 21. 2. Signal vor 1kHz (−24dB) an die Line IN-Buchse eingeben und die Aufnahmetaste drücken. 3. ATT so abstimmen, daß der Ausgangspegel an der LINE OUT-Buchse 0,65V wird. 4. Justierung auf "0dB". A. VR103 (L-CH) und VR104 (R-CH) so abstimmen, daß die Fluoreszenzmeter eine beleuchtete Anzeige bis "0dB" anzeigen, wenn der Eingangssignalpegel 0,9dB über dem Standard-Eingangspegel liegt. B. Anschlie end überprüfen, daß die Fluoreszenzmeter eine beleuchtete Anzeige bis "+1dB" anzeigen, wenn der Eingangssignalpegel 1,0dB über dem Standard-Eingangspegel liegt. 5. Justierung auf "−20dB". A. VR101 (L-CH) und VR102 (R-CH) so abstimmen, daß die Fluoreszenzmeter eine Leuchtanzeige bis "−20dB" anzeigen, wenn der Eingangssignalpegel 15,1dB unter dem Standard-Eingangs-pegel liegt. B. Anschließend überprüfen, daß die Fluoreszenzmeter eine beleuchtete Anzeige bis "−15dB" anzeigen, wenn der Eingangssignalpegel 15,0dB unter dem Standard-Eingangspegel liegt.
Ⓚ Gesamt-frequenzgang Bedingung: * Aufnahme und Wiedergabe * Eingangsregler...Max. * Ausgangsregler...Max. Meßgerät: * Röhrenvoltmeter * NF-Generator * Abschwächer * Testband (Leerband) QZZCRA für Normal QZZCRX für CrO_2 QZZCRY für FeCr QZZCRZ für Metal	**Anm.:** Vor Messung und Abgleich des Gesamtfrequenzganges ist sicherzustellen, daß der Frequenzgang bei Wiedergabe korrekt ist (Vgl. entspr. Abschnitt). 1. Den Meßaufbau zeigt Fig. 21. 2. Testband einlegen. 3. 1kHz vom NF-Generator über den Abschwächer dem NF-Eingang zuführen. 4. Den Abschwächer so einstellen, daß der Eingangspegel −20dB des Stand-Aufnahmepegels berträge (Standard-Aufnahmepegel = Anzeige "0" des Pegel-Meters). 5. Zu diesem Zeitpunkt beträgt der Ausgangspegel 0,065V. 6. Bei dem gleichen Pegel sind die Frequenzen 50Hz, 100Hz, 200Hz, 1kHz, 4kHz, 8kHz, 10kHz und 13kHz (15kHz für Metal band CrO_2 band order FeCr band) aufzunehme. 7. Diese Aufnahme wiedergeben und dabei die Abweichungen der Pegel der einzeinen Frequenzen vom 1kHz-Pegel in dB bestimmen. 8. Prüfen, ob die Abweichungen innerhalb der in Fig. 24 angegebenen Toleranzen liegen. 9. Den Vormagnetisierungs-und den Entzerrungs-Wahlschalter in die Metal, CrO_2 und Fe-Cr position stellen. 10. Die gleichen Messungen durchführen. 11. Sicherstellen, daß alle Meßwerte innerhalb der in Fig. 25 dargestellten Grenzen liegen.
Ⓛ Gesamt-Frequenzgang (Als Grundlage für den Abgleich)	1. Werden die mittleren und hohen Frequenzen gemäßder durchgezogenen Linie in Fig. 26 zu stark wiedergegeben, so ist der Vormagnetisierungsstrom durch Drehen, die folgenden VR zu erhöhen. Metal position...VR407, CrO_2 position .....VR406, Fe-Cr position...VR405, Normal position...VR404 Kanal und VR16 (rechter Kanal) zu erhöhen. 2. Erfolgt ein Abfall, wie ihn die Strichlinie in Fig. 26 zeigt, so ist an diesen Reglern entgegen der Pfeilrichtung zu drehen, die folgenden VR zu erhöhen. Metal position...VR407, CrO_2 position ...VR406, Fe-Cr position...VR405, Normal position...VR404

Gegenstand	Messung und Einstellung
	Anm.: 1. Müßte der Vormagnetisierungsstrom unter 0,17mA eingestellt werden, um den geforderten Frequenzgang zu erreichten, so ist nach Anweisung 2 zu verfahren, weil zu geringer Vormagnetisierungsstrom den Klirrfaktor verschichter. 2. Für die Messung des Vormagnetisierungsstromes sei auf den Abschnitt "Vormagnetisierung" hingewiesen. **Abgleich 2-Aufnahme-Entzerrerspule** 1. Verläuft der Frequenzgang bei mittleren Frequenzen flach und zeigt bei höheren Frequenzen einen scharfen Anstieg oder Abfall entsprechend Fig. 27 die folgenden Korrecturspulen zu erhöhen. Metal position CrO_2 position .....L205 (L-CH), L206 (R-CH) Fe-Cr position Normal position.....L203 (L-CH), L204 (R-CH)
Ⓜ Dolby-Schaltung Bedingung: * Aufnahme * Eingangsregler...Max. Meßgerät: * Röhrenvoltmeter * NF-Generator * Abschwächer * Oszillograf	1. Gerät in Stellung "Aufnahme" betreiben und Dolby-Schalter ausschalten. Dem NF-eingang ein 5kHz-Signal zuführen, daß an TP5 (linker Kanal) und TP6 (rechter Kanal) −35dB erhalten werden. 2. Prüfen, ob das Signal bei eingeschaltetem Dolby-Schalter um 8 (±1) dB größer ist als bei ausgeschaltetem Dolby-Schalter.

DISASSEMBLY INSTRUCTIONS

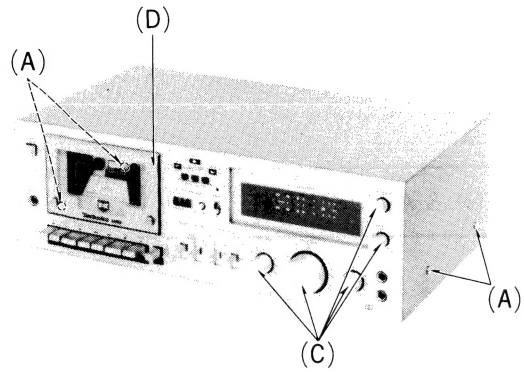


Fig. 2

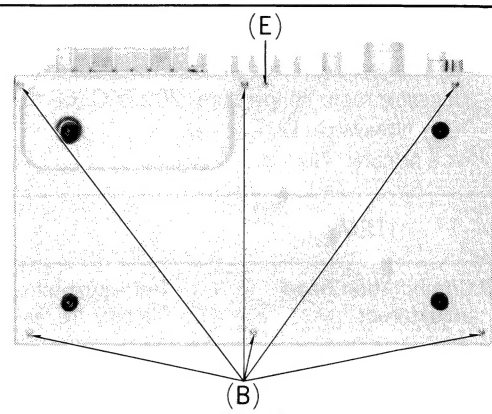


Fig. 3

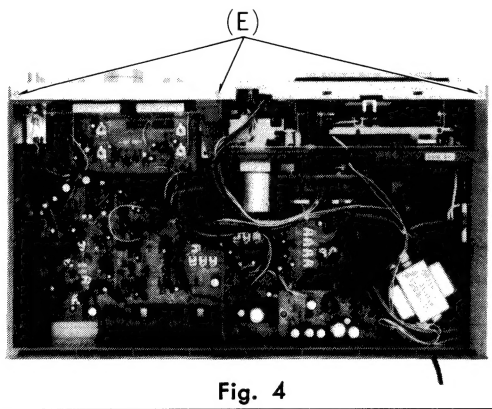


Fig. 4

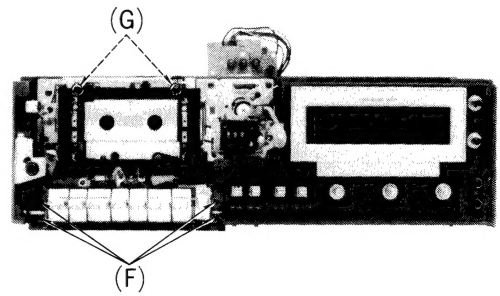


Fig. 5

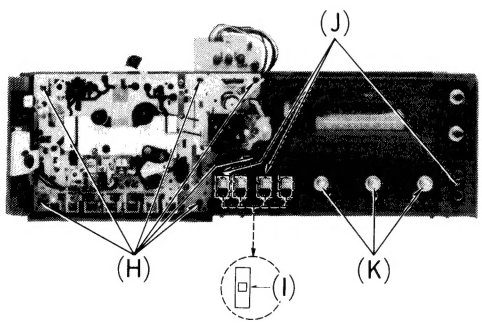


Fig. 6

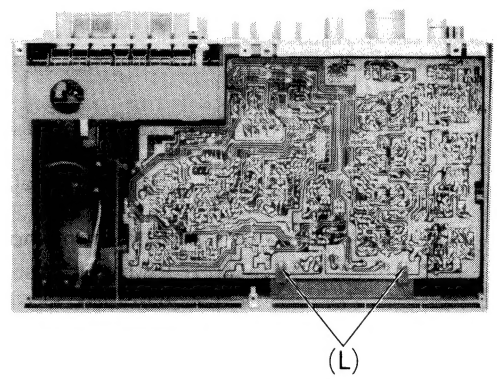


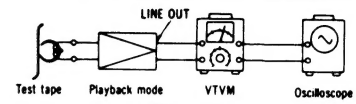
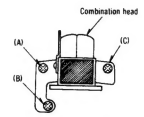
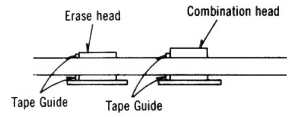
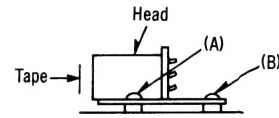
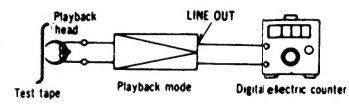
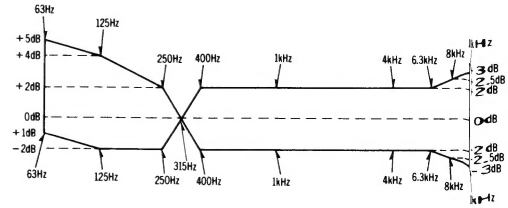
Fig. 7

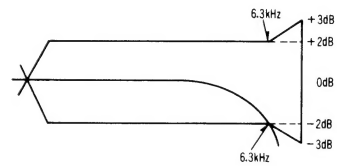
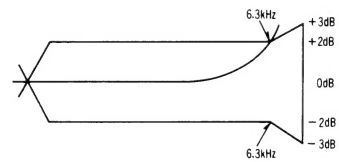
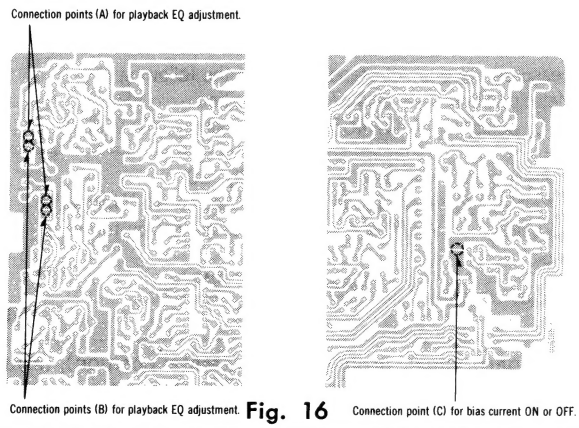
Procedure	To remove —— .	Remove —— .	Shown in fig. —— .
1	Case cover	• 4 screws ····· (A)	2
2	Bottom cover	• 6 red screws ····· (B)	3
3	Front pamel	• 5 control knobs ····· (C) • Cassette lid ····· (D) • 4 screws ····· (E)	2 2 3, 4
4	Control button assembly and cassette holder	• 4 screws ····· (F) • 2 screws ····· (G)	5 5
5	Mechanism	• 6 red screws ····· (H)	6
5	Main circuit board	• 4 spacers ····· (I) • 3 screws ····· (J) • 3 nuts ····· (K) • 2 screws ····· (L)	6 6 6 7

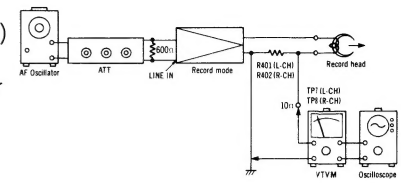
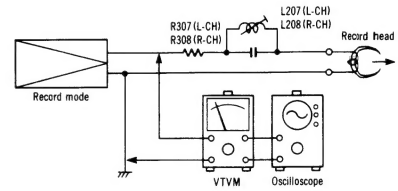
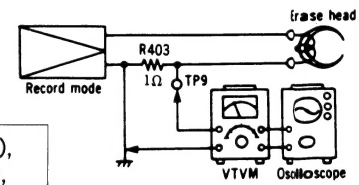
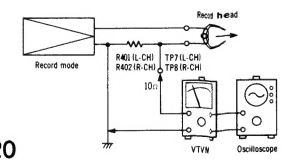
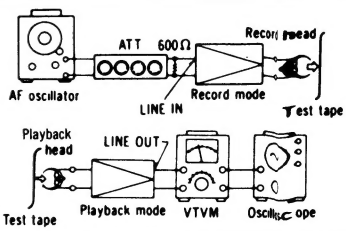
MEASUREMENT AND ADJUSTMENT METHODS

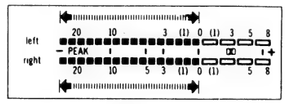
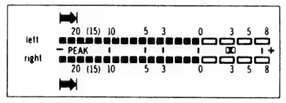
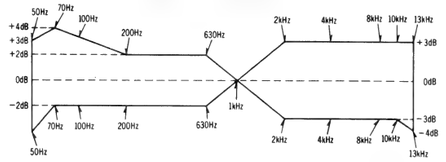
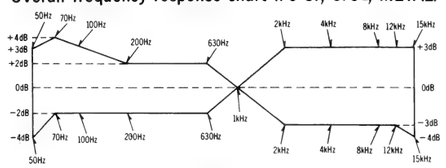
NOTE:

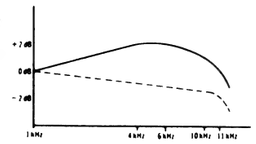
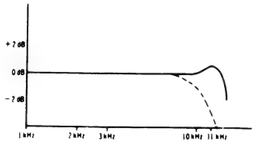
1. Make sure heads are clean.
2. Make sure capstan and pressure roller are clean.
3. Judgeable room temperature: 20±5°C (68±9°F).
4. Dolby NR switch: OUT.
5. Tape selector: Normal.
6. Bias-adjustment control: Center.
7. Meter brightness control: Center.
8. Monitor switch: Tape position.

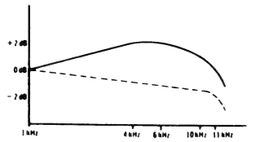
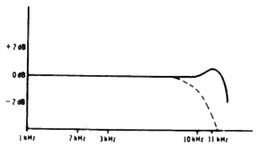
ITEM	MEASUREMENT & ADJUSTMENT
Ⓐ Combination head adjustment Condition: * Playback mode Equipment: * VTVM * Oscilloscope * Test tape (Tape-path viewer with mirror) ··· QZZCRD * Test tape (azimuth) ··· QZZCFM	1. Test equipment connection is shown in fig. 8. 2. Playback the test tape (QZZCRD). 3. In this condition, adjust screws (A) and (B) shown in fig. 9 and 11 so that the tape may not get curled or malformed by tape guides of the erase head and the combination head (Fig. 10 shows correct condition).  Fig. 8 **NOTE:** For the combination head carefulley adjust the height so that the head surface contacts the tape in parallel shown in fig. 11. 4. Playback the azimuth tape (QZZCFM 8kHz). 5. Adjust the combination head angle adjustment screw (C) in fig. 9 so that the output level at LINE OUT becomes maximum. 6. Measure both channels, and adjust levels for equal output. 7. After adjustment, lock the head adjustment screws with lacquer.  Fig. 9  Fig. 10  Fig. 11
Ⓑ Tape speed accuracy Condition: * Playback mode Equipment: * Digital electronic counter or frequency counter * Test tape ··· QZZCWAT	1. Test equipment connection is shown in fig. 12. 2. Playback test tape (QZZCWAT 3,000Hz), and supply playback signal to frequency counter. 3. Measure this frequency. 4. On the basis of 3,000Hz, determine value by following formula: $\text{Tape speed accuracy} = \frac{f-3{,}000}{3{,}000} \times 100\ (\%)$ where, f = measured value 5. Take measurement at middle section of tape.  Fig. 12 **Standard value: ±1.5%** **Adjustment method** 1. Playback the test tape (middle). 2. Adjust tape speed adjustment VR (shown in fig. 29) so that frequency becomes 3,000Hz. **Tape speed fluctuation** Make measurements in same manner as above (beginning, middle and end of tape), and determine the difference between maximum and minimum values and calculate as follows: $\text{Tape speed fluctuation} = \frac{f_1-f_2}{3{,}000} \times 100\ (\%)$ f_1 = maximum value, f_2 = minimum value **Standard value: 1%**
Ⓒ Playback frequency response Condition: * Playback mode * Output level control ··· MAX Equipment: * VTVM * Oscilloscope * Test tape ··· QZZCFM	1. Test equipment connection is as same as "Head azimuth adjustment" but use the test tape instead of head azimuth tape (See fig. 8). 2. Place UNIT into playback mode. 3. Playback frequency response test tape. **Playback frequency response chart**  Fig. 13

ITEM	MEASUREMENT & ADJUSTMENT
	4. Measure output level at 10kHz, 8kHz, 4kHz, 1kHz, 315Hz, 250Hz, 125Hz and 63Hz, and compare each output level with standard frequency 315Hz, at LINE OUT. 5. Make measurement for both channels. 6. Make sure that the measured value is within the range specified in the frequency response chart. **Adjustment method** 1. At 4kHz If the measured output level at 4kHz is not equal output level at 315Hz, Adjust VR1 (L-CH) and VR2 (R-CH). 2. At high frequency range If the measured value is not within standard (shown in fig. 13) at high frequency range, change the soldering point as the following examples. a. When the output level decreases as shown in fig. 14, solder the connection point (B) on the printed circuit board (See fig. 16). **The corrected value** 6kHz: about +0.4dB; 8kHz: about +0.8dB; 10kHz: about +1.3dB  **Fig. 14** b. When the output level increases as shown in fig. 15, unsolder the connection point (A) on the printed circuit board (See fig. 16). **The corrected value** 6kHz: about −0.4dB; 8kHz: about −1.0dB; 10kHz: about −1.6dB  **Fig. 15**
	 **Fig. 16**
Ⓓ Playback gain Condition: * Playback mode * Output level control ··· MAX Equipment: * VTVM * Oscilloscope * Test tape ··· QZZCFM	1. Test equipment connection is shown in fig. 8. 2. Playback standard recording level portion on test tape (QZZCFM 315Hz), and using VTVM measure the output level at LINE OUT jack. 3. Make measurement for both channels. **Standard value: 0.65V** **Adjustment method** 1. If measured value is not standard, adjust VR3 (L-CH), VR4 (R-CH) (See fig. 28 on page 6). 2. After adjustment, check "Playback frequency response" again.

ITEM	MEASUREMENT & ADJUSTMENT
E Recording current Condition: * Record mode Equipment: * VTVM * Oscilloscope * AF oscillator * ATT	1. Test equipment connection is shown in fig. 17. 2. Stop bias oscillation by unsoldering the connection point (C) for bias current ON or OFF in fig. 16. 3. Supply 1 kHz signal (−24 dB) and adjust ATT until monitor level at LINE OUT becomes 0.65 V. 4. Measure voltage and then calculate recording current by formura given below. $\text{Recording current} = \frac{\text{Value read on VTVM (V)}}{10\ (\Omega)}$  Fig. 17 **Standard value: around 230μA (Metal position), around 180μA (CrO_2 position), around 150μA (Fe-Cr position), around 150μA (Normal position)** 5. If the measured value is not within standard, adjust the following VR. Metal position ····· VR205 (L-CH), VR206 (R-CH) CrO_2 position ····· VR207 (L-CH), VR208 (R-CH) Fe-Cr position ····· VR209 (L-CH), VR210 (R-CH) Normal position ····· VR211 (L-CH), VR212 (R-CH)
F Bias leak Condition: * Record mode Equipment: * VTVM * Oscilloscope	1. Test equipment connection is shown in fig. 18. 2. Place UNIT into record mode. 3. Adjust trap coil L207 (L-CH), L208 (R-CH), so that measured value on VTVM becomes minimum. 4. Take adjustment for both channels.  Fig. 18
G Erase current Condition: * Record mode Equipment: * VTVM * Oscilloscope	1. Test equipment connection is shown in fig. 19. 2. Read voltage on VTVM and calculate erase current by following formula: $\text{Erase current (A)} = \frac{\text{Value read on VTVM (V)}}{1\ (\Omega)}$  Fig. 19 **Standard value: More than 95 mA (Metal position), More than 68 mA (CrO_2 position), More than 55 mA (Fe-Cr position), More than 45 mA (Normal position)** 3. If measured value is not standard, adjust the following VR. Metal position ····· VR407, CrO_2 position ····· VR406, Fe-Cr position ····· VR405, Normal position ····· VR404
H Bias current Condition: * Bias adjustment control ··· Center * Record mode * When bias current is adjusted on one channel only, note that bias current on the other channel may vary. Equipment: * VTVM * Oscilloscope	1. Test equipment connection is shown in fig. 20. 2. Place UNIT into record mode, and tape selector to "Normal". 3. Read voltage on VTVM and calculate bias current by following formula: $\text{Bias current (A)} = \frac{\text{Value read on VTVM (V)}}{10\ (\Omega)}$  Fig. 20 **Standard value: around 2.2 mA (Metal position), around 1.6 mA (CrO_2 position), around 1.3 mA (Fe-Cr position), around 1.1 mA (Normal position)** 4. Adjust VR401 (L-CH), VR402 (R-CH) (See fig. 28).
I Overall gain Condition: * Record/playback mode * Input level control ··· MAX * Output level control ··· MAX * Standard input level; MIC ····· ··· −72±4 dB LINE IN ··· −24±3 dB DIN ····· −41±3 dB	1. Test equipment connection is shown in fig. 21. 2. Supply 1 kHz signal (−24 dB) from AF oscillator, through ATT, to LINE IN. 3. Adjust ATT until monitor level at LINE OUT becomes 0.65 V. 4. Using test tape, make recording. 5. Playback recorded tape, and make sure the value at LINE OUT on VTVM becomes 0.65 V.  Fig. 21

ITEM	MEASUREMENT & ADJUSTMENT
Equipment: * AF oscillator * VTVM * Oscilloscope * ATT * Test tape (reference blank tape) ··· QZZCRA for Normal ··· QZZCRX for CrO_2 ··· QZZCRY for Fe-Cr ··· QZZCRZ for Metal	6. If measured value is not 0.65 V, adjust following VR. Metal position ····· VR205 (L-CH), VR206 (R-CH) CrO_2 position ····· VR207 (L-CH), VR208 (R-CH) Fe-Cr position ····· VR209 (L-CH), VR210 (R-CH) Normal position ····· VR211 (L-CH), VR212 (R-CH) 7. Repeat from step (2).
J Fluorescent meter Condition: * Record mode * Input level control ··· MAX * Output level control ··· MAX * Tape selectors ··· Normal position * Monitor switch ··· Source position Equipment: * VTVM * AF oscillator * ATT	1. Test equipment connection is shown in fig. 21. 2. Set the meter brightness control to "BRIGHT" position. 3. Supply 1 kHz signal (−24 dB) to the LINE IN jack, then press the record button. 4. Adjust the ATT so that the output level at LINE OUT jack becomes 0.65 V (=standard input level). 5. Adjustment at "0 dB": A. Adjust VR103 (L-CH) and VR104 (R-CH) so that the Fluorescent meters show an illuminated indication up to "0 dB" when the input signal level is 0.9 dB higher than the standard input level. B. Then confirm that the Fluorescent meters show an illuminated indication up to "+1 dB" when the input signal level is 1 dB higher than the standard input level.  Fig. 22  Fig. 23 6. Adjustment at "−20 dB": A. Adjust VR101 (L-CH) and VR102 (R-CH) so that the Fluorescent meters show an illuminated indication up to "−20 dB" when the input signal level is 15.1 dB lower than the standard input level. B. Then confirm that the Fluorescent meters show an illuminated indication up to "−15 dB" when the input signal level is 15 dB lower than the standard input level.
K Overall frequency response Condition: * Record/playback mode * Input level control ··· MAX * Output level control ··· MAX Equipment: * VTVM * AF oscillator * ATT * Test tape (reference blank tape) ··· QZZCRA for Normal ··· QZZCRX for CrO_2 ··· QZZCRY for Fe-Cr ··· QZZCRZ for Metal	**Note:** Before measuring, and adjusting, make sure of the playback frequency response (For the method of measurement, please refer to the playback frequency response). 1. Test equipment connection is shown in fig. 21. 2. Load reference blank test tape and place UNIT into record mode. 3. Supply 1 kHz signal from AF oscillator through ATT to LINE IN. 4. Adjust ATT so that input level is −20 dB below standard recording level (standard recording level = 0 VU). 5. At this time, LINE OUT level the indicates 0.065 V. 6. Record each frequency 50 Hz, 100 Hz, 200 Hz, 1 kHz, 2 kHz, 4 kHz, 8 kHz, 10 kHz and 13 kHz (15 kHz for Metal tape, CrO_2 tape or Fe-Cr tape) at the same level. **Overall frequency response chart (Normal)**  Fig. 24 **Overall frequency response chart (Fe-Cr, CrO_2, METAL)**  Fig. 25 7. Playback and express in dB the difference between playback output level of each frequency based on playback output level of 1 kHz. 8. Make sure that the measured value is within the range specified in the overall frequency response chart. 9. Set the bias selector to CrO_2, Fe-Cr or Metal position. 10. Measure as same as manner above. 11. Make sure that the measured value is within the range specified in the overall frequency response chart for CrO_2, Fe-Cr or Metal tape shown in fig. 25.

ITEM	MEASUREMENT & ADJUSTMENT
L Overall frequency response adjustment (As a standard for adjustment)	**Adjustment 1 — Using bias current** 1. When the frequency response between the middle and high frequency range becomes higher than the standard value, as shown by the solid line in fig. 26, increase the bias current by turning following VR. Metal position ····· VR407, CrO_2 position ····· VR406, Fe-Cr position ····· VR405, Normal position ····· VR404 2. When it becomes lower, as shown by dotted line, reduce the bias current by turning following VR. Metal position ····· VR407, CrO_2 position ····· VR406, Fe-Cr position ····· VR405, Normal position ····· VR404  Fig. 26 **Note:** 1. For adjustment when the bias current is lower than the standard value use the procedure indicated in adjustment 2, because reducting the bias current beyond this point may worsen the distortion factor. 2. For the method of bias current measurement, refer to "Bias current adjustment" on page 5.  Fig. 27 **Adjustment 2 — Using the peaking coil for recording equalization** When the frequency response is flat in the middle frequency range and makes a sharp rise or drop in the high frequency range, as shown in fig. 27, adjust by turning following peaking coil. Metal position CrO_2 position } ····· L205 (L-CH), L206 (R-CH) Fe-Cr position Normal position ····· L203 (L-CH), L204 (R-CH)
M Dolby NR circuit Condition: * Record mode * Input level control ··· MAX Equipment: * VTVM * AF oscillator * ATT * Oscilloscope	1. Place UNIT into record mode, set the Dolby NR switch to OUT position and supply to LINE IN to obtain −35 dB at TP5 (L-CH), TP6 (R-CH) (frequency 5 kHz). 2. Confirm that the value at IN position is 8 (±1) dB greater than the value at OUT position of Dolby NR switch.

ITEM	MEASUREMENT & ADJUSTMENT
Ⓛ Overall frequency response adjustment (As a standard for adjustment)	**Adjustment 1—Using bias current** 1. When the frequency response between the middle and high frequency range becomes higher than the standard value, as shown by the solid line in fig. 26, increase the bias current by turning following VR. Metal position ····· VR407, CrO_2 position ····· VR406, Fe-Cr position ····· VR405, Normal position ····· VR404 2. When it becomes lower, as shown by dotted line, reduce the bias current by turning following VR. Metal position ····· VR407, CrO_2 position ····· VR406, Fe-Cr position ····· VR405, Normal position ····· VR404  **Fig. 26** **Note:** 1. For adjustment when the bias current is lower than the standard value use the procedure indicated in adjustment 2, because reducting the bias current beyond this point may worsen the distortion factor. 2. For the method of bias current measurement, refer to "Bias current adjustment" on page 5.  **Fig. 27** **Adjustment 2—Using the peaking coil for recording equalization** When the frequency response is flat in the middle frequency range and makes a sharp rise or drop in the high frequency range, as shown in fig. 27, adjust by turning following peaking coil. Metal position CrO_2 position } ····· L205 (L-CH), L206 (R-CH) Fe-Cr position Normal position ····· L203 (L-CH), L204 (R-CH)
Ⓜ Dolby NR circuit Condition: * Record mode * Input level control ··· MAX Equipment: * VTVM * AF oscillator * ATT * Oscilloscope	1. Place UNIT into record mode, set the Dolby NR switch to OUT position and supply to LINE IN to obtain −35 dB at TP5 (L-CH), TP6 (R-CH) (frequency 5 kHz). 2. Confirm that the value at IN position is 8 (±1) dB greater than the value at OUT position of Dolby NR switch.

ADJUSTMENT PARTS LOCATION

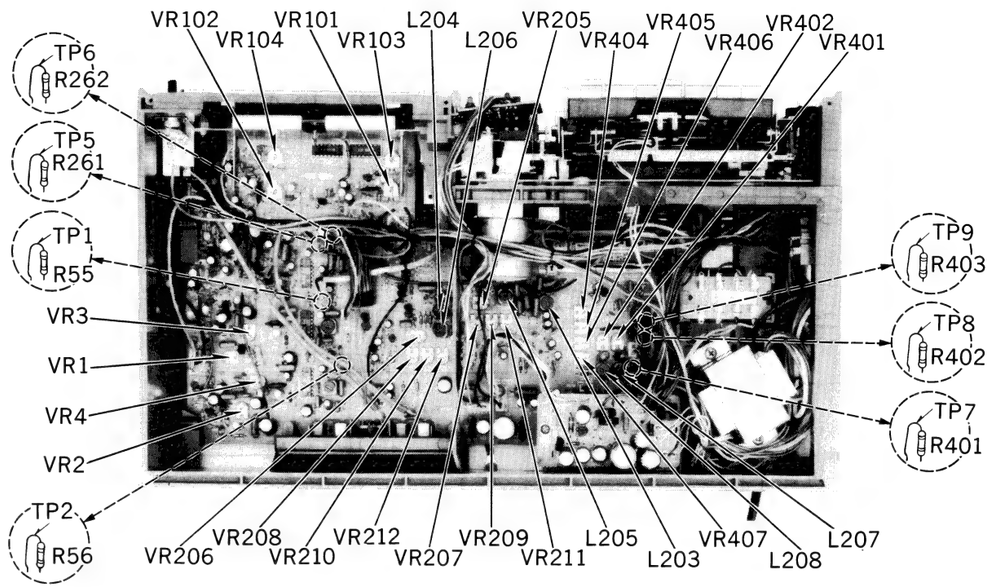
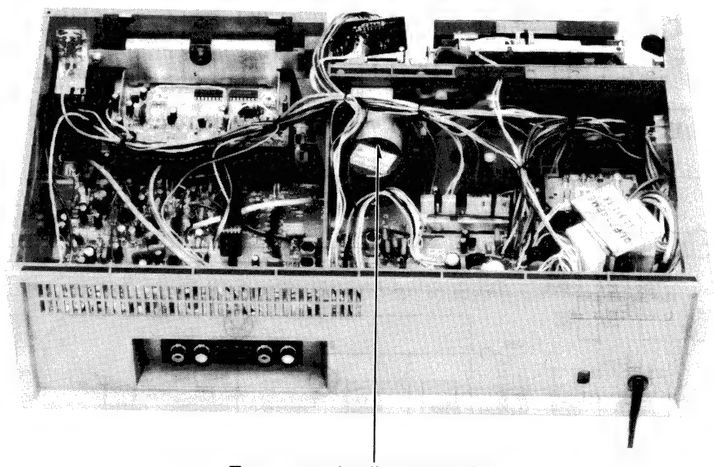


Fig. 28

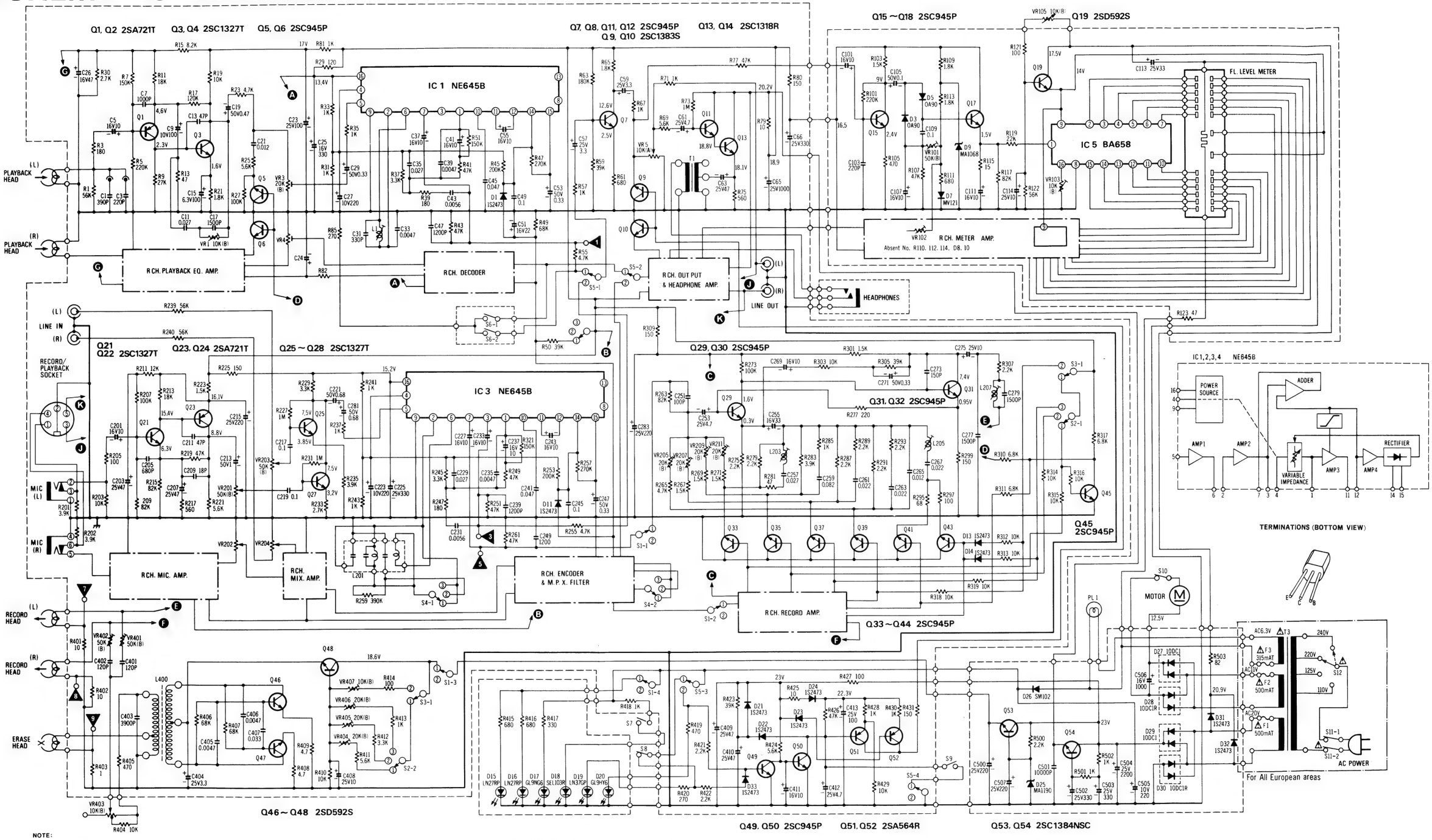


Tape speed adjustment VR

Fig. 29

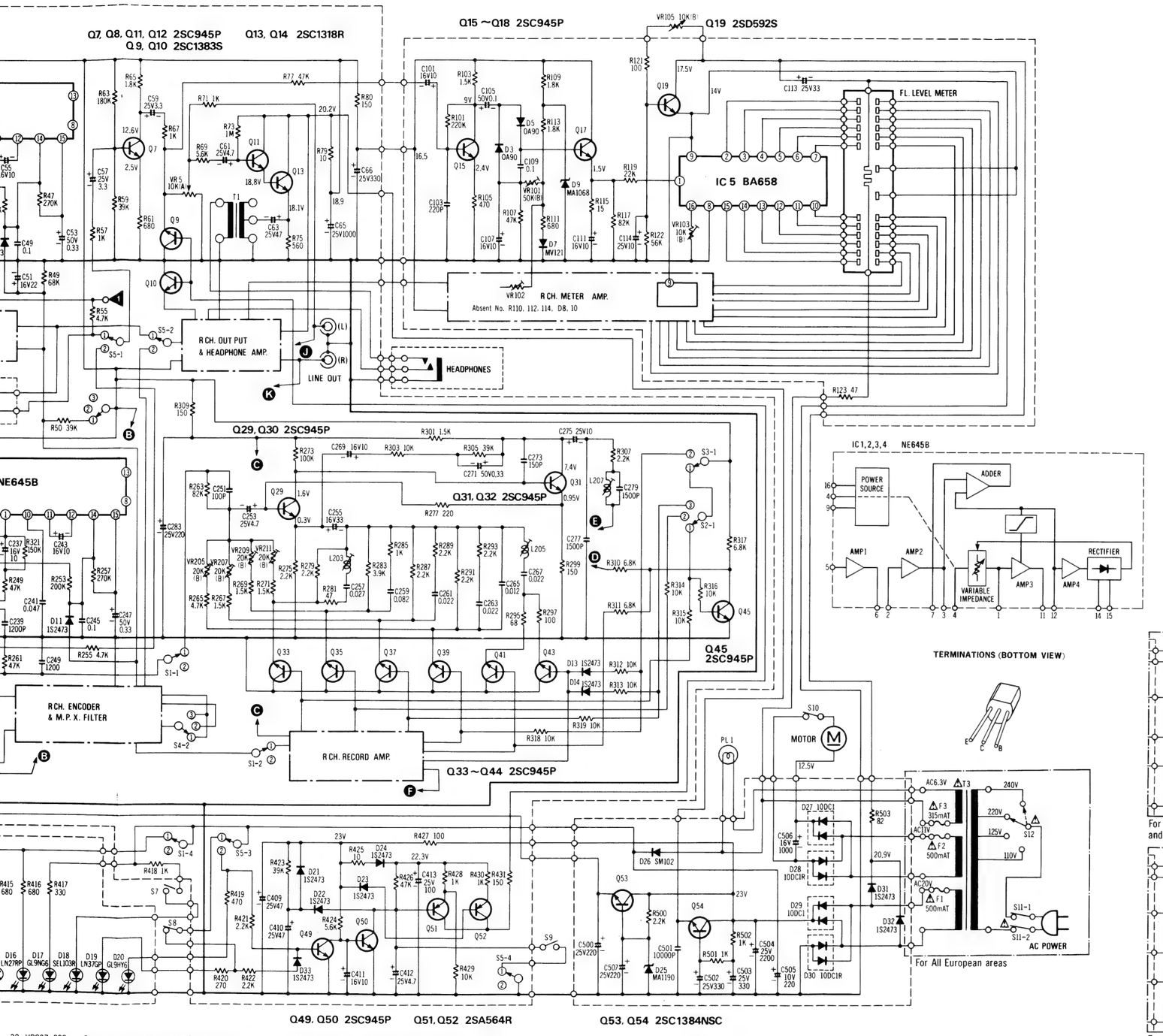
RS-M63

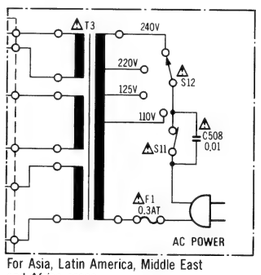
SCHEMATIC DIAGRAM



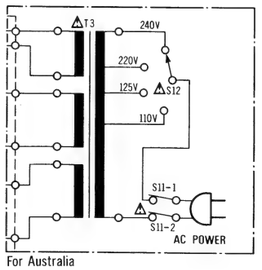
NOTE:

1. S1-1 ~ S1-4 ..... Record/playback select switch (shown in record position).
2. S2-1, S2-2 ..... Tape select switch (1 ··· Normal, 2 ··· Fe-Cr, 3 ··· CrO2).
3. S3-1, S3-2 ..... Metal tape select switch (1 ··· OUT, 2 ··· Metal).
4. S4-1 ~ S4-3 ..... Dolby and MPX filter IN/OUT select switch (1 ··· Dolby OUT, Filter OUT, 2 ··· Dolby IN, Filter OUT, 3 ··· Dolby IN, Filter IN).
5. S5-1 ~ S5-4 ..... Monitor select switch (1 ··· Tape monitor, 2 ··· Source monitor).
6. S6-1, S6-2 ..... Cue/review switch (shown in OFF position).
7. S7 ..... Memory switch (shown in OFF position).
8. S8 ..... Playback switch (shown in ON position).
9. S9 ..... Pause switch (shown in OFF position).
10. S10 ..... Motor ON/OFF switch (shown in ON position).
11. S11 ..... Power ON/OFF switch (shown in ON position).
12. S12 ..... AC power voltage select switch.
13. VR1, 2 ..... Playback equalizer adjustment VR.
14. VR3, 4 ..... Playback gain adjustment VR.
15. VR5, 6 ..... Output level control.
16. VR101, 102 ..... Level meter adjustment VR (for −20dB indication).
17. VR103, 104 ..... Level meter adjustment VR (for 0dB indication).
18. VR105 ..... Meter brightness control.
19. VR201, 202 ..... MIC level control.
20. VR203, 204 ..... LINE IN level control.
21. VR205, 206 ..... Recording gain adjustment VR (for Metal tape).
22. VR207, 208 ..... Recording gain adjustment VR (for CrO2 tape).
23. VR209, 210 ..... Recording gain adjustment VR (for Fe-Cr tape).
24. VR211, 212 ..... Recording gain adjustment VR (for Normal tape).
25. VR401, 402 ..... Bias current adjustment VR; VR401 (L-CH), VR402 (R-CH)
26. VR403 ..... Bias current control.
27. VR404 ..... Bias current adjustment VR (for Normal tape).
28. VR405 ..... Bias current adjustment VR (for Fe-Cr tape).
29. VR406 ..... Bias current adjustment VR (for CrO2 tape).
30. VR407 ..... Bias current adjustment VR (for Metal tape).
31. L1, 2 ..... Bias trap coil.
32. L201, 202 ..... MPX filter coil.
33. L203, 204 ..... Recording equalizer adjustment coil (for Normal tape).
34. L205, 206 ..... Recording equalizer adjustment coil (for Fe-Cr, CrO2 and Metal tape).
35. L207, 208 ..... Bias leakage adjustment coil.
36. Resistor values are in ohms (Ω). 1/4 watt unless specified otherwise.
    K = 1,000Ω.
37. Capacitor values are in microfarads (μF) unless specified otherwise.
    P = Pico-farads.
38. All voltage values shown in circuitry are under no signal condition with volume control at minimum position.
    For measurement, use VTVM.
39. The mark (▼) shows test point. e.g. ▼= Test point 1.





For Asia, Latin America, Middle East and Africa areas



For Australia

NOTE: RESISTORS
- ERD ··· Carbon
- ERG ··· Metal oxide
- ERO ··· Metal-film
- ERX ··· Metal-film
- ERQ ··· Fuse type metallic
- ERC ··· Solid
- ERF ··· Cement

CAPACITORS
- ECQ□ ····· Ceramic
- ECK□ ····· Ceramic
- ECC□ ····· Ceramic
- ECF□ ····· Ceramic
- ECQM····· Polyster
- ECQE····· Polyster
- ECQF····· Polypropylene
- ECE□ ····· Electrolytic
- ECE□N··· Non polar electrolytic
- ECQS····· Polystyrene
- ECS□ ····· Tantalum

NOTE: ⚠ indicates that only parts specified by the manufacturer be used for safety.

Ref. No.	Part No.
RESISTORS	
R1, 2	ERD25TJ563
R3, 4	ERD25TJ181
R5, 6	ERD25TJ224
R7, 8	ERD25TJ154
R9, 10	ERD25TJ273
R11, 12	ERD25TJ183
R13, 14	ERD25TJ470
R15, 16	ERD25TJ822
R17, 18	ERD25TJ124
R19, 20	ERD25TJ103
R21, 22	ERD25TJ182
R23, 24	ERD25TJ472
R25, 26	ERD25TJ562
R27, 28	ERD25TJ104
R29	ERG1ANJ121
R30	ERD25TJ272
R31, 32, 33, 34, 35, 36	ERD25TJ102
R37, 38	ERD25TJ332
R39, 40	ERD25TJ181
R41, 42, 43, 44	ERD25TJ473
R45, 46	ERD25TG2003
R47, 48	ERD25TJ274
R49	ERD25TJ683
R50	ERD25TJ393
R55, 56	ERD25TJ472
R57, 58	ERD25TJ102
R59, 60	ERD25TJ393
R61, 62	ERD25TJ681
R63, 64	ERD25TJ184
R65, 66	ERD25TJ182
R67, 68	ERD25TJ102
R69, 70	ERD25TJ562
R71, 72	ERD25TJ102
R73, 74	ERD25TJ105
R75, 76	ERG1ANJ561
R77, 78	ERD25TJ473
R79	ERX1ANJ100
R80 DB	ERG1ANJ151
※For All European areas. NA	ERD25TJ151
※For Asia, Latin America, Middle East, Africa areas and Australia.	
R81, 82	ERD25TJ102
R85	ERD25TJ271
R101, 102	ERD25TJ224
R103, 104	ERD25TJ152
R105, 106	ERD25TJ471
R107, 108	ERD25TJ473
R109	ERD25TJ182
R111	ERD25TJ681
R113	ERD25TJ182
R115, 116	ERD25TJ150
R117, 118	ERD25TJ823
R119, 120	ERD25TJ222
R121	ERD25TJ101
R122	ERD25TJ393
R123	ERD50TJ470
R201, 202	ERD25TJ392
R203, 204	ERD25TJ103
R205, 206	ERD25TJ101
R207, 208	ERD25TJ104
R209, 210	ERD25TJ823
R211, 212	ERD25TJ123
R213, 214	ERD25TJ183
R215, 216	ERD25TJ683
R217, 218	ERD25TJ561
R219, 220	ERD25TJ473
R221, 222	ERD25TJ562
R223, 224	ERD25TJ152
R225, 226	ERG1ANJ151
※For All European areas. NA	ERD25TJ151
※For Asia, Latin America, Middle East, Africa areas and Australia.	
R227, 228	ERD25TJ105
R229, 230	ERD25TJ332
R231, 232	ERD25TJ105
R233, 234	ERD25TJ272
R235, 236	ERD25TJ392
R237, 238	ERD25TJ102
R239, 240	ERD25TJ563
R241, 242, 243, 244	ERD25TJ102
R245, 246	ERD25TJ332
R247, 248	ERD25TJ181
R249, 250, 251, 252	ERD25TJ473
R253, 254	ERD25TG2003
R255, 256	ERD25TJ472
R257, 258	ERD25TJ274
R259, 260	ERD25TJ394
R261, 262	ERD25TJ473
R263, 264	ERD25TJ823
R265, 266	ERD25TJ472
R267, 268, 269, 270, 271, 272	ERD25TJ152
R273, 274	ERD25TJ104
R275, 276	ERD25TJ222
R277, 278	ERD25TJ224
R279, 280	ERD25TJ222
R281, 282	ERD25TJ470
R283, 284	ERD25TJ392
R285, 286	ERD25TJ102
R287, 288, 289, 290, 291, 292, 293, 294	ERD25TJ222
R295, 296	ERD25TJ680
R297, 298	ERD25TJ101
R299, 300	ERD25TJ151
R301, 302	ERD25TJ152
R303, 304	ERD25TJ103
R305, 306	ERD25TJ393
R307, 308	ERD25TJ222
R309 DB	ERG1ANJ151
※For All European areas. NA	ERD25TJ151
※For Asia, Latin America, Middle East, Africa areas and Australia.	
R310, 311	ERD25TJ682
R312, 313, 314, 315, 316	ERD25TJ103
R317	ERD25TJ682
R318, 319	ERD25TJ103
R401, 402	ERD25TJ100
R403	ERD25TJ1R0
R405	ERD25TJ471
R406, 407	ERD25TJ683
R408, 409	ERD25TJ4R7
R410	ERD25TJ103
R411	ERD25TJ562
R412	ERD25TJ332
R413	ERD25TJ102
R414	ERD25TJ101
R415, 416	ERD25TJ681
R417	ERD25TJ331
R418	ERD25TJ102
R419	ERD25TJ471
R420	ERD25TJ271
R421, 422	ERD25TJ222
R423	ERD25TJ393
R424	ERD25TJ562
R425	ERD25TJ100
R426	ERD25TJ473
R427 DB	ERG2ANJ101
※For All European areas. NA	ERD25TJ101
※For Asia, Latin America, Middle East, Africa areas and Australia.	
R428	ERD25TJ102
R429	ERD25TJ103
R430	ERD25TJ102
R431	ERD25TJ151
R500	ERD25TJ222
R501, 502 ⚠	ERD25TJ102
R503 DB ⚠	ERG1ANJ820
※For All European areas. NA ⚠	ERD25TJ820
※For Asia, Latin America, Middle East, Africa areas and Australia.	
VARIABLE RESISTORS	
VR1, 2	EVNK4AA00B14
VR3, 4	EVNK4AA00B24
VR5, 6	EWKKAA072A14
VR101, 102	EVLS3AA00B54
VR103, 104	EVLS3AA00B14
VR105	EVH60AF25B14
VR201, 202	EWKN3AF22A54
VR203, 204	EWKN3AF21A54
VR205, 206, 207, 208, 209, 210, 211, 212	EVNK4AA00B24
VR401, 402	EVNK4AA00B54
VR403	EVH03AF25B14
VR404, 405, 406	EVNK4AA00B24
VR407	EVNK4AA00B14
CAPACITORS	
C1, 2	ECKD1H391K
C3, 4	ECKD1H221K
C5, 6	ECEA16M10R
C7, 8	ECKD1H102K
C9, 10	ECEA10M100
C11, 12	ECQM05273KZ
C13, 14	ECCD1H470KC
C15, 16	ECEA0JS101
C17, 18	ECKD1H152K
C19, 20	ECEA50ZR47
C21, 22	ECQM05123KZ
C23, 24	ECEA1ES101
C25	ECEA1HS101
C26	ECEA1HS470
C27, 28	ECEA1AS221
C29, 30	ECEA50MR33
C31, 32	ECQS1331KZ
C33, 34	ECQM05472KZ
C35, 36	ECQM05273JZ
C37, 38	ECEA1HS100
C39, 40	ECQM05472JZ
C41, 42	ECEA1HS100
C43, 44	ECQM05562JZ
C45, 46	ECQM05473JZ
C47, 48	ECKD1H122K
C49, 50	ECQM05104KZ
C51	ECEA1HS220
C53, 54	ECEA50ZR33
C55, 56	ECEA1HS100
C57, 58, 59, 60	ECEA50Z3R3
C61, 62	ECEA25Z4R7
C63, 64	ECEA1ES470
C65	ECEA1VS102
C66	ECEA1ES331
C101, 102	ECEA1HS100
C103, 104	ECKD1H221K
C105, 106	ECEA50ZR1
C107, 108	ECEA1HS100
C109, 110	ECFDD104KXY
C111, 112	ECEA1HS100
C113	ECEA1ES330
C114	ECEA1ES100
C201, 202	ECEA16M10
C203, 204	ECEA1ES470
C205, 206	ECKD1H681K
C207, 208	ECEA1ES470
C209, 210	ECCD1H180K
C211, 212	ECCD1H470K
C213, 214	ECEA50Z1
C215, 216	ECEA1ES221
C217, 218, 219, 220	ECQM05104KZ
C221, 222	ECEA50ZR68
C223, 224	ECEA1AS221
C225, 226	ECEA1ES331
C227, 228	ECEA1HS100
C229, 230	ECQM05273JZ
C231, 232	ECQM05562JZ
C233, 234	ECEA1HS100
C235, 236	ECQM05472JZ
C237, 238	ECEA1HS100
C239, 240	ECKD1H122K
C241, 242	ECQM05473JZ

* Input level control ··· MAX
* Output level control ··· MAX

SPECIFICATIONS

Playback S/N ratio Test tape ··· QZZCFM	More than 47 dB
Overall distortion Test tape ··· QZZCRA for Normal ··· QZZCRX for CrO_2 ··· QZZCRY for Fe-Cr ··· QZZCRZ for Metal	 Less than 2.3% (Normal) Less than 3.3% (Fe-Cr, CrO_2, Metal)
Overall S/N ratio Test tape ··· QZZCRA	More than 43 dB (without NAB filter)

22. VR207, 208 ····· Recording gain adjustment VR (for CrO_2 tape).
23. VR209, 210 ····· Recording gain adjustment VR (for Fe-Cr tape).
24. VR211, 212 ····· Recording gain adjustment VR (for Normal tape).
25. VR401, 402 ····· Bias current adjustment VR; VR401 (L-CH), VR402 (R-CH)
26. VR403 ····· Bias current control.
27. VR404 ····· Bias current adjustment VR (for Normal tape).
28. VR405 ····· Bias current adjustment VR (for Fe-Cr tape).
29. VR406 ····· Bias current adjustment VR (for CrO_2 tape).
30. VR407 ····· Bias current adjustment VR (for Metal tape).
31. L1, 2 ····· Bias trap coil.
32. L201, 202 ····· MPX filter coil.
33. L203, 204 ····· Recording equalizer adjustment coil (for Normal tape).
34. L205, 206 ····· Recording equalizer adjustment coil (for Fe-Cr, CrO_2 and Metal tape).
35. L207, 208 ····· Bias leakage adjustment coil.
36. Resistor values are in ohms (Ω), 1/4 watt unless specified otherwise. K = 1,000Ω.
37. Capacitor values are in microfarads (μF) unless specified otherwise. P = Pico-farads.
38. All voltage values shown in circuitry are under no signal condition with volume control at minimum position. For measurement, use VTVM.
39. The mark (▼) shows test point. e.g. ▼= Test point 1.

CIRCUIT BOARD

MAIN CIRCUIT BOARD

Ref. No.	Part No.
C243, 244	ECEA1HS100
C245, 246	ECQM05104KZ
C247, 248	ECEA50ZR33
C249, 250	ECKD1H122K
C251, 252	ECCD1H101K
C253, 254	ECEA25Z4R7
C255, 256	ECEA1CS330
C257, 258	ECQM05273KZ
C259, 260	ECQM05104KZ
C261, 262, 263, 264	ECQM05223KZ
C265, 266	ECQM05123KZ
C267, 268	ECQM05223KZ
C269, 270	ECEA1HS100
C271, 272	ECEA50ZR33
C273, 274	ECCD1H151K
C275, 276	ECEA1HS100
C277, 278	ECKD1H152K
C279, 280	ECQS1152K
C281, 282	ECEA50ZR68
C283	ECEA1ES221
C401, 402	ECCD1H121KC
C403	ECQS1392K
C404	ECEA50Z3R3
C405, 406	ECQM05472KZ
C407	ECQM05333KZ
C408	ECEA1HS100
C409, 410	ECEA1ES470
C411	ECEA1HS100
C412	ECEA25Z4R7
C413	ECEA1ES101
C500	ECEA1ES221
C501	ECKD1H103PF
C502, 503	△ ECEA1ES331
C504	△ ECEA1CS222
C505	△ ECEA1AS221
C506	△ ECEA1HS102
C507	△ ECEA1ES221
C508 Ⓝ △	ECQM6103KZ

※For Asia, Latin America, Middle East and Africa areas.

TRANSISTORS

Q1, 2	2SA721
Q3, 4	2SC1327S
Q5, 6, 7, 8	2SC945P
Q9, 10	2SC1383S
Q11, 12	2SC945P
Q13, 14	2SC1318P
Q15, 16, 17, 18	2SC945P
Q19	2SD592NCS
Q21, 22	2SC1327S
Q23, 24	2SA721
Q25, 26, 27, 28	2SC1327S
Q29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45	2SC945P
Q46, 47, 48	2SD592NCS
Q49, 50	2SC945P
Q51, 52	2SA564R
Q53, 54	2SC1384

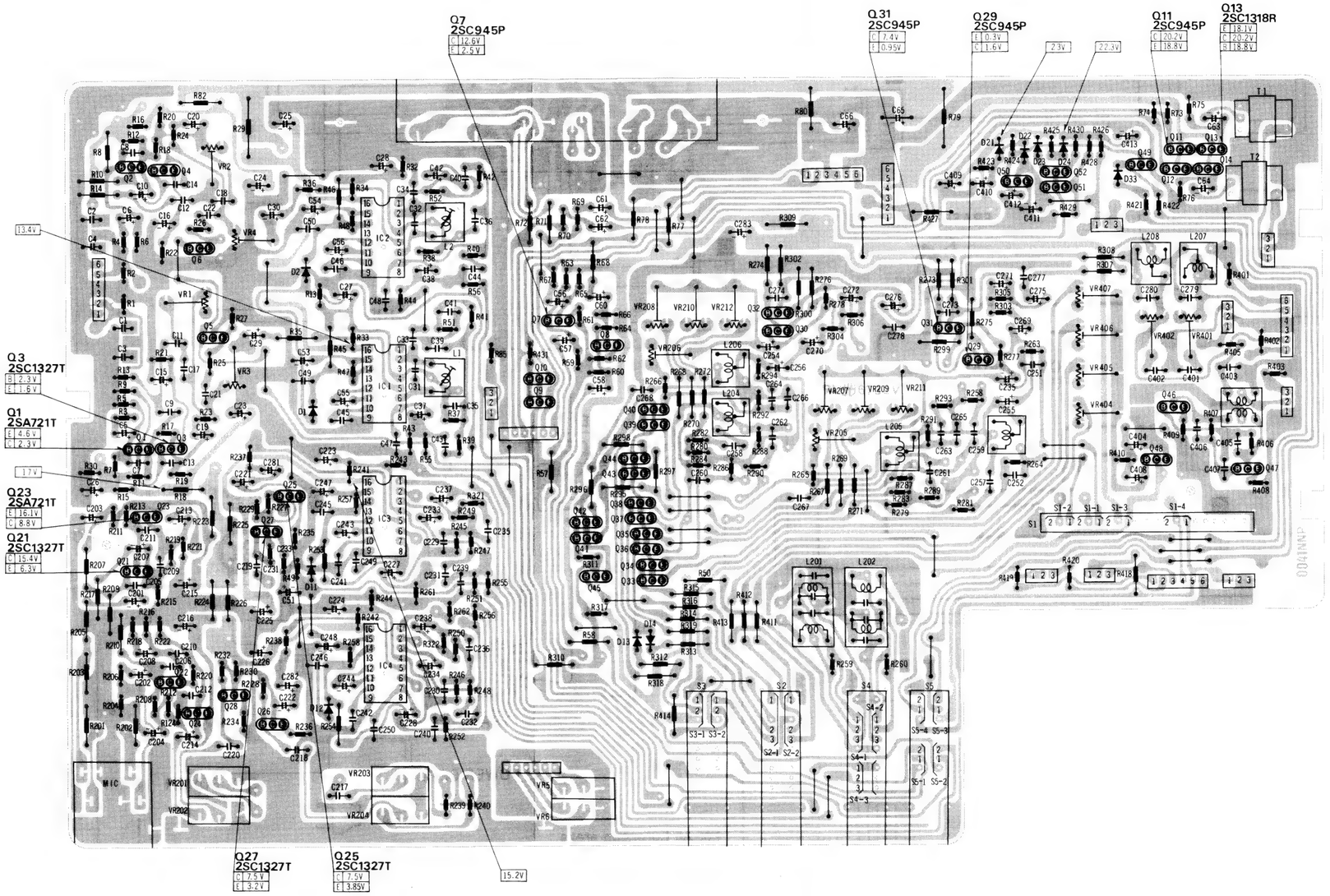
DIODES

D1, 2	1S2473
D3, 4, 5, 6	OA90M
D7	MV121
D9	MA1068
D11, 12, 13, 14	1S2473
D15, 16	LN27RP
D17	GL9NG6
D18	SEL103R
D19	LN37GP
D20	GL9HY6
D21, 22, 23, 24	1S2473
D25	MA1190
D26	△ SM102
D27	△ RVD10DC2
D28	△ RVD10DC2R
D29	△ RVD10DC2
D30	△ RVD10DC2R
D31, 32, 33	△ 1S2473

INTEGRATED CIRCUITS

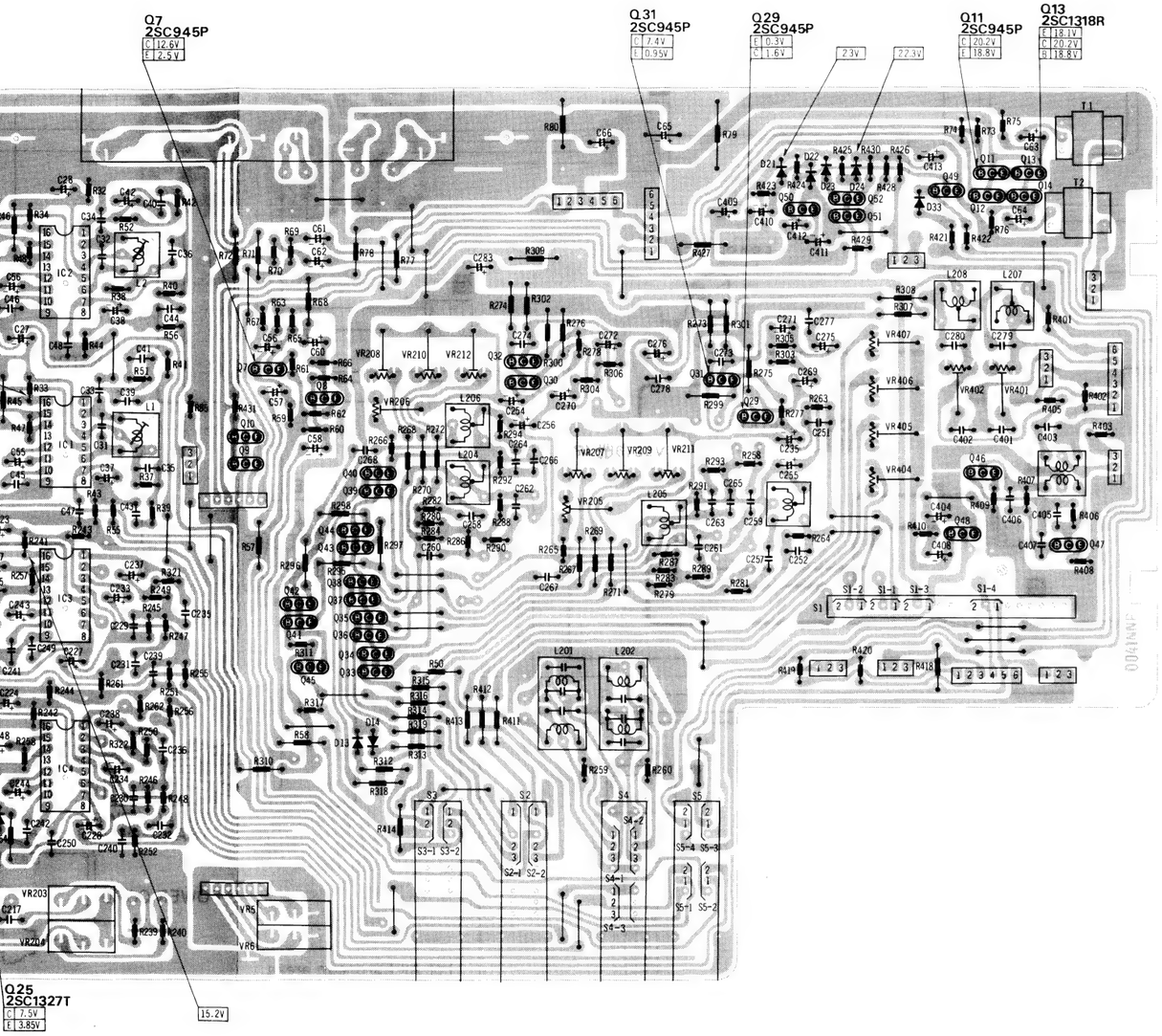
IC1, 2, 3, 4	NE645B
IC5, 6	QVIBA658

Ref. No.	Part No.	Part Name & Description
TRANSFORMERS		
T1, 2	QLT2D26X	Headphones Transformer
T3 Ⓓ △	QLPD37EME	AC Power Transformer
※For All European areas except United Kingdom.		
ⒷⓃⒶ △	QLP214EME	〃
※For Asia, Latin America, Middle East, Africa areas, United Kingdom and Australia.		
COILS		
L1, 2	QLQX1032W	Peaking Coil
L201, 202	QLM9Z6K	MPX Filter
L203, 204, 205, 206, 207, 208	QLQX1032W	Peaking Coil
L400	QLB0158	Bias Oscillation Coil
SWITCHES		
S1	QSS7203	Slide Switch
S2	QES1493	Lever Switch
	"Silver Type"	
	QES1511	〃
	"Black Type"	
S3	QES1483	〃
	"Silver Type"	
	QES1486	〃
	"Black Type"	
S4	QES1493	〃
	"Silver Type"	
	QES1511	〃
	"Black Type"	
S5	QES1483	〃
	"Silver Type"	
	QES1486	〃
	"Black Type"	
S6	QSB0186MU	Leaf Switch
S7	QSB0194	〃
S8, 9	QSB0195	〃
S10	QSB0178IB	〃
S11		
ⒹⒷⒶ △	QSW2214A	Push Switch
※For All European areas and Australia.		
Ⓝ △	QSW1206A	〃
※For Asia, Latin America, Middle East and Africa areas.		
S12 △	QSR1407H	AC Power Voltage Select Switch
FUSES		
F1 ⒹⒷ △	XBAQ0003	Fuse (500mAT)
※For All European areas.		
Ⓝ △	XBA2E03NS5	Fuse (0.3AT)
※For Asia, Latin America, Middle East and Africa areas.		
F2 ⒹⒷ △	XBAQ0003	Fuse (500mAT)
※For All European areas.		
F3 ⒹⒷ △	XBAQ0006	Fuse (315mAT)
※For All European areas.		



NOTE:
The circuit shown in red on the conductor is B circuit.
Values indicated in [ ] are DC voltage between the chassis and electrical parts.

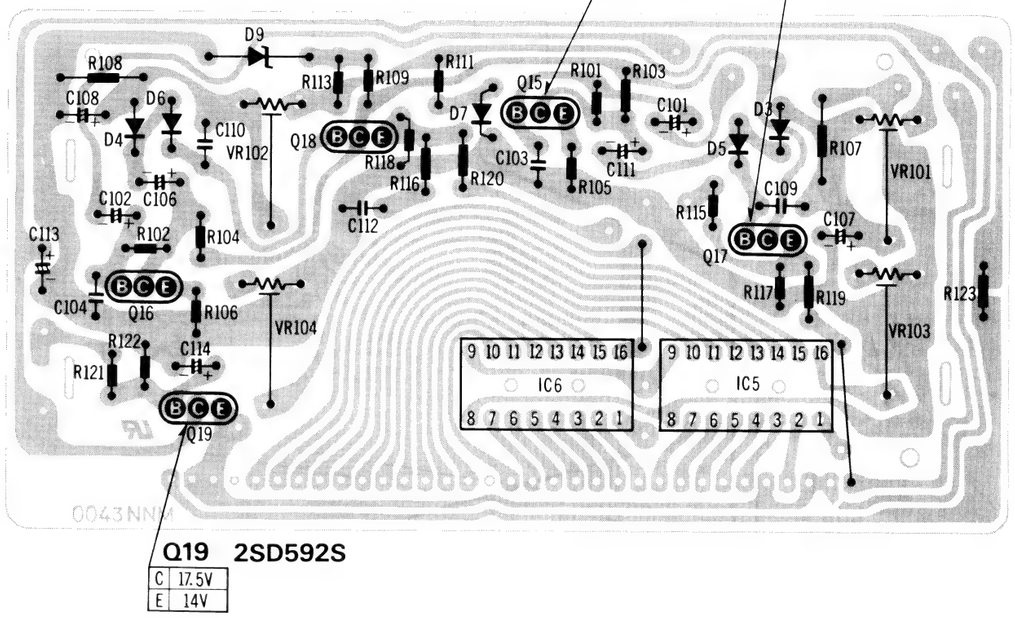
D



NOTE:

The circuit shown in red on the conductor is B circuit.
Values indicated in [ ] are DC voltage between the chassis and electrical parts.

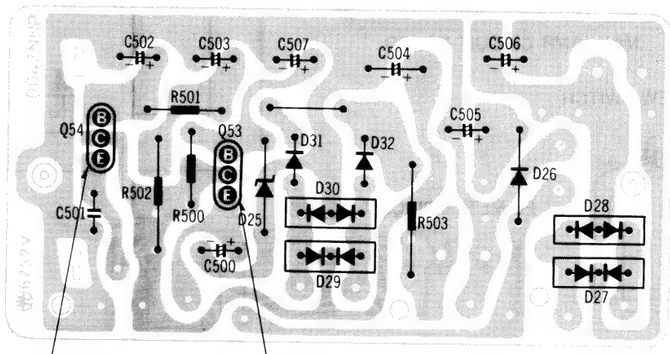
FL METER CIRCUIT BOARD



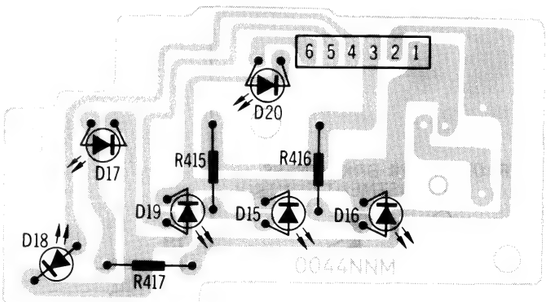
Q19 2SD592S

C	17.5V
E	14V

POWER SUPPLY CIRCUIT BOARD

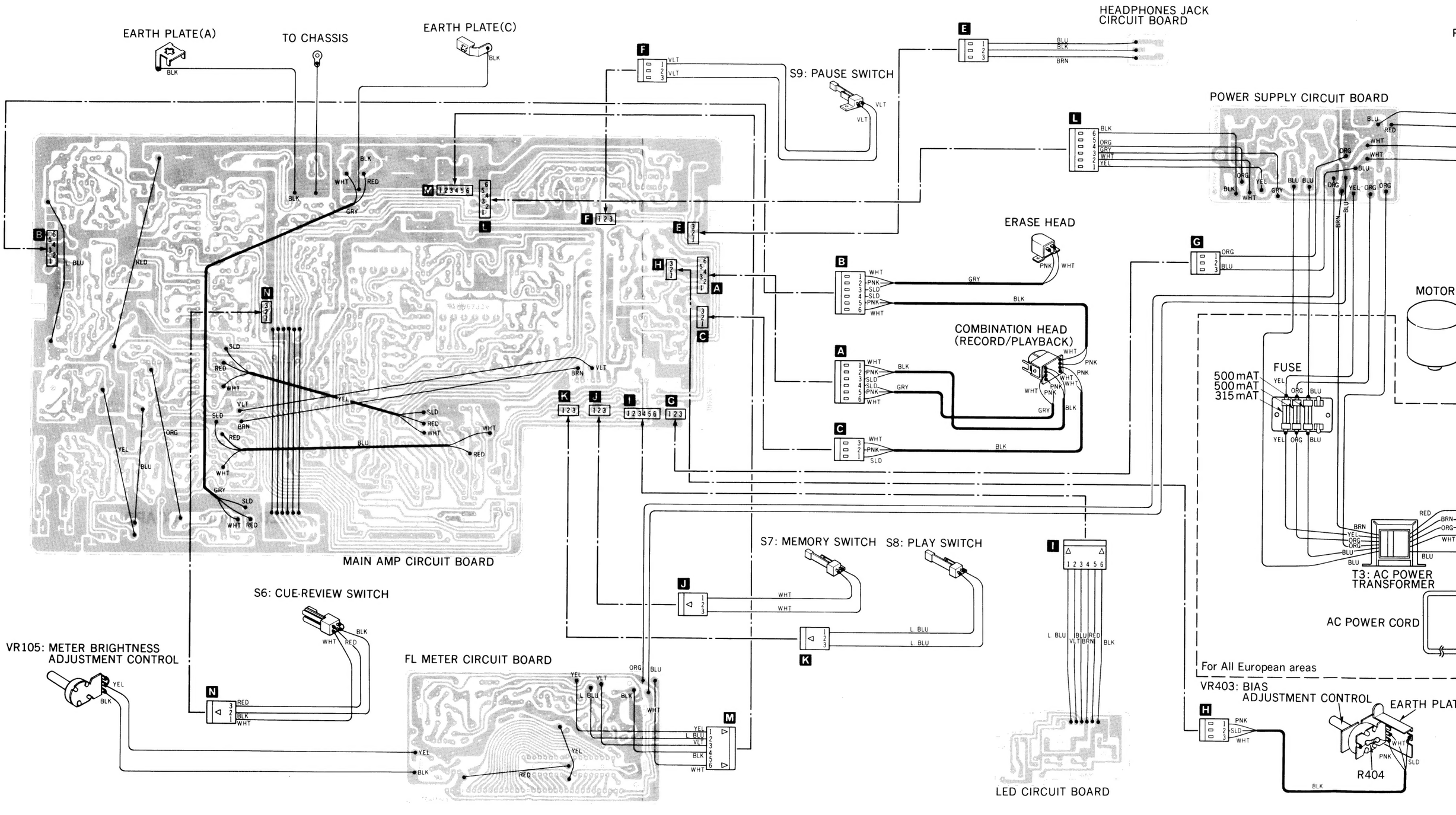


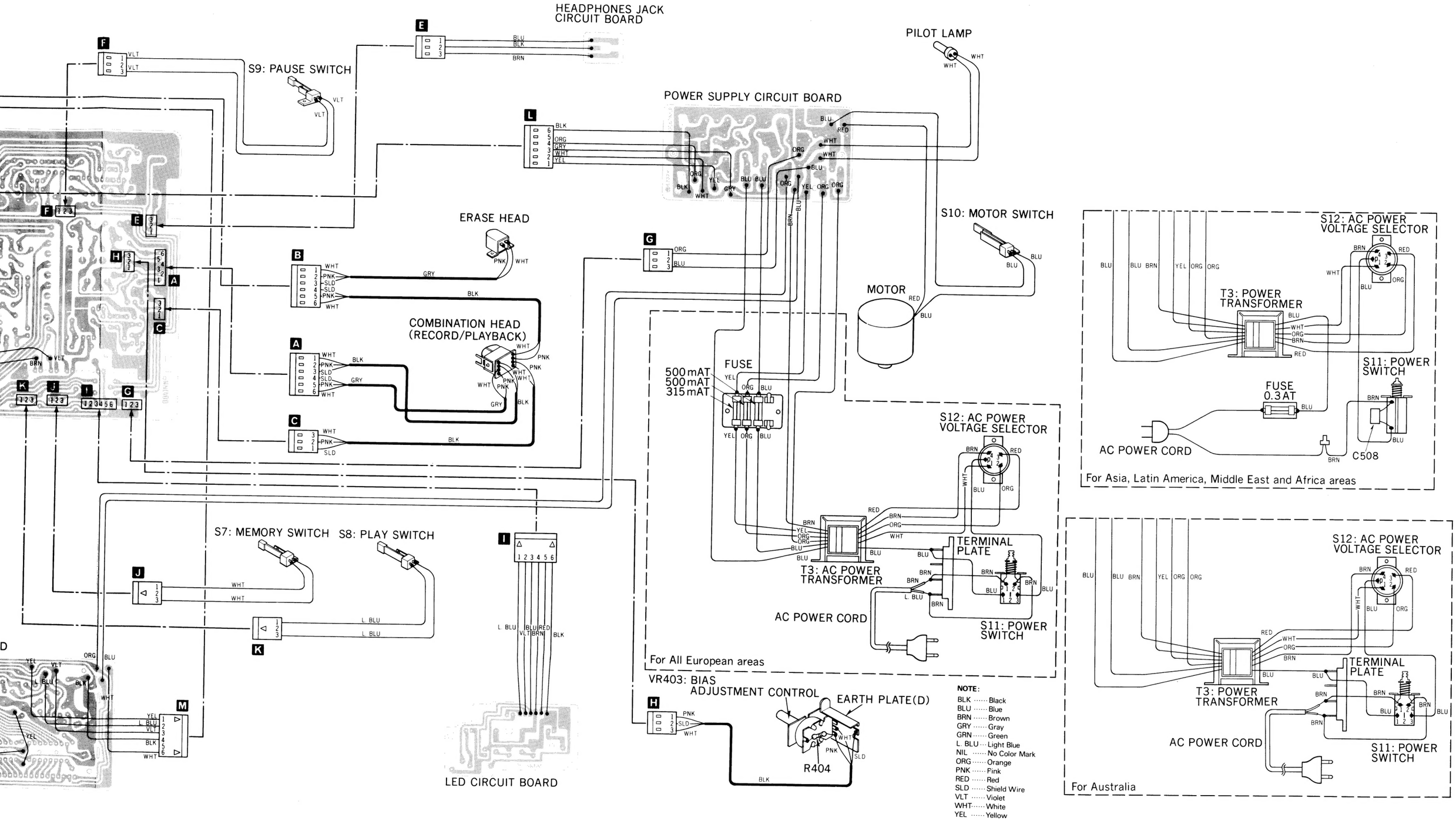
LED CIRCUIT BOARD



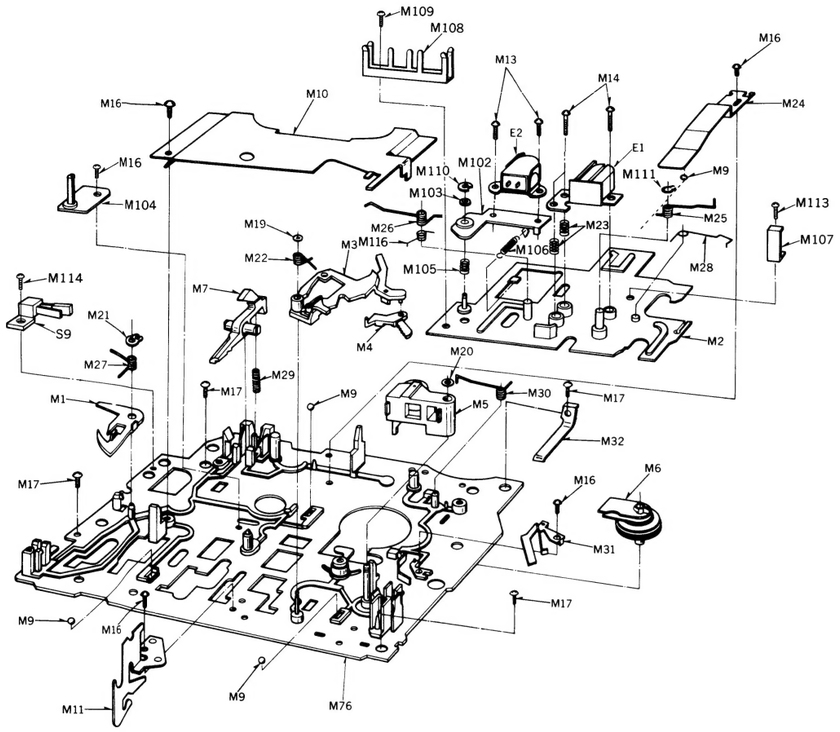
RS-M63

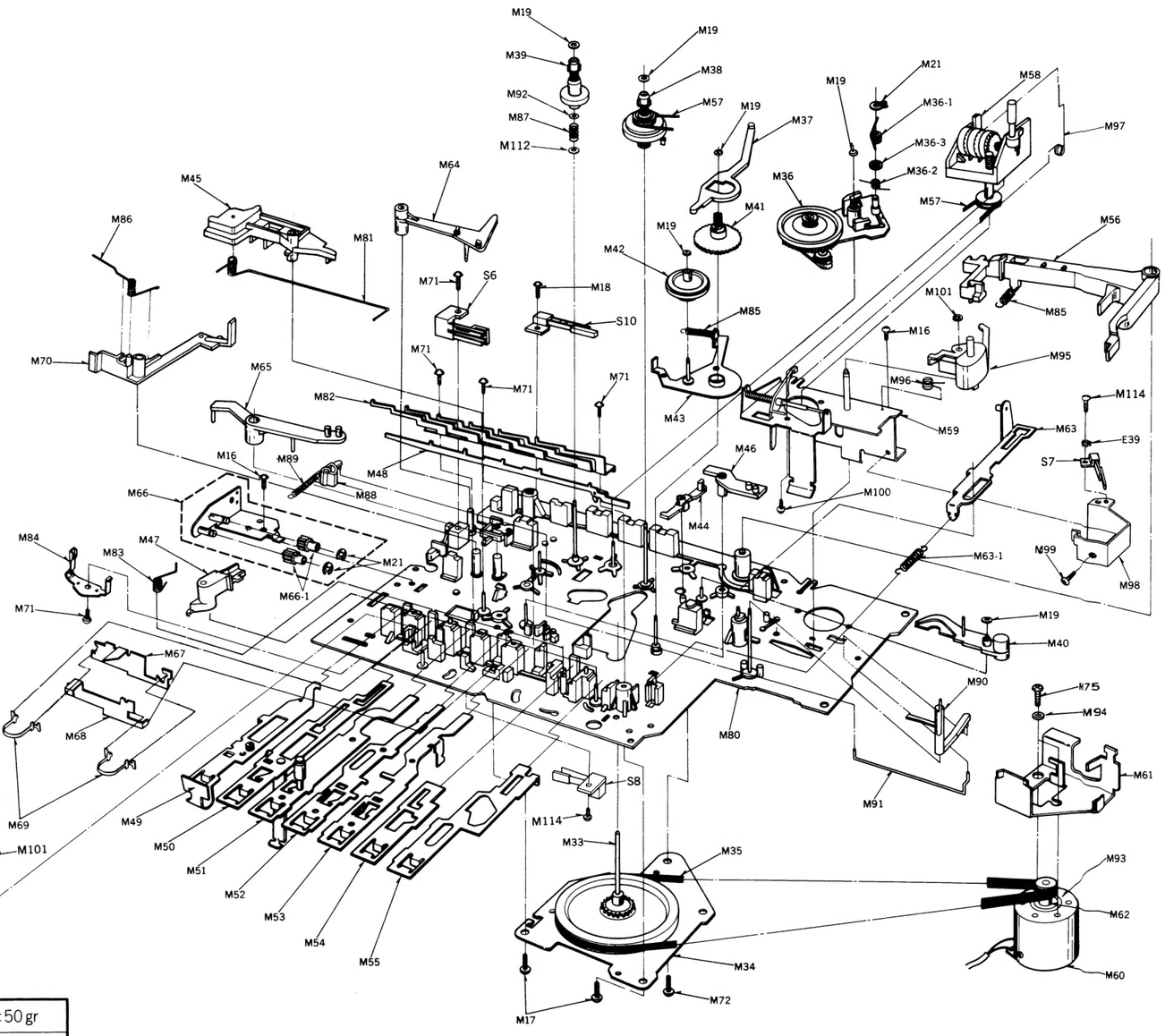
WIRING CONNECTION DIAGRAM




HEADPHONES JACK CIRCUIT BOARD
S9: PAUSE SWITCH
PILOT LAMP
POWER SUPPLY CIRCUIT BOARD
ERASE HEAD
COMBINATION HEAD (RECORD/PLAYBACK)
S10: MOTOR SWITCH
MOTOR
FUSE
500mAT
500mAT
315mAT
S12: AC POWER VOLTAGE SELECTOR
T3: POWER TRANSFORMER
S11: POWER SWITCH
FUSE 0.3AT
AC POWER CORD
C508
For Asia, Latin America, Middle East and Africa areas
TERMINAL PLATE
For All European areas
S7: MEMORY SWITCH
S8: PLAY SWITCH
LED CIRCUIT BOARD
VR403: BIAS ADJUSTMENT CONTROL
EARTH PLATE(D)
R404
For Australia
NOTE:
BLK ..... Black
BLU ..... Blue
BRN ..... Brown
GRY ..... Gray
GRN ..... Green
L. BLU ... Light Blue
NIL ..... No Color Mark
ORG ..... Orange
PNK ..... Fink
RED ..... Red
SLD ..... Shield Wire
VLT ..... Violet
WHT ..... White
YEL ..... Yellow

EXPLODED VIEWS





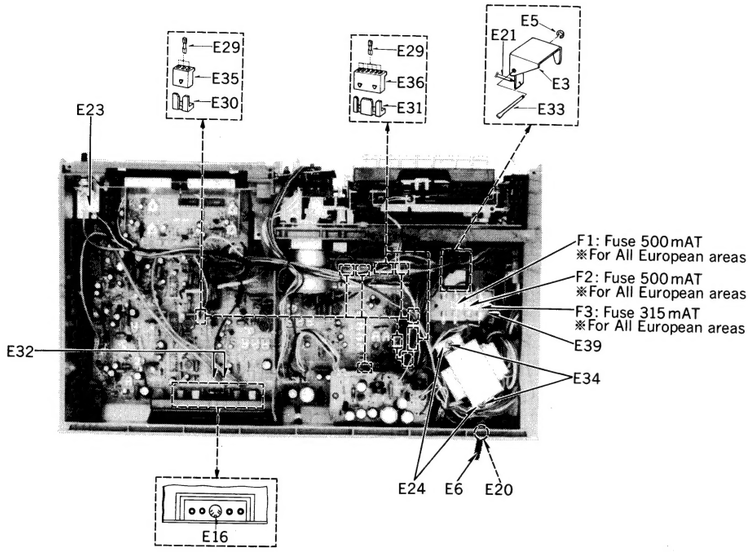
Ref. No.	Part No.	Part Name & Description
	MECHANICAL PARTS	
M1	QML2898	Pause Lock Plate
M2	QXK2181	Head Base Plate
M3	QML3047	Obstruction Lever
M4	QML3048	Driving Lever
M5	QXL1057	Pressure Roller Lever Assembly
M6	QXI0098	Takeup Idler Assembly
M7	QML3051	Erase Safety Lever
M9	QDK1012	Steel Ball
M10	QMF1939	Chassis Cover-A
M11	QMA3169	Shaft Reinforcement Angle
M13	XSN2+10	Screw ⊕2×10
M14	QHQ1226	Screw
M16	XTN26+5B	Screw ⊕2.6×5
M17	XTN3+10B	Screw ⊕3×10
M18	XTN26+8B	Screw ⊕2.6×8
M19	QBW2008	Snap Washer
M20	QBW2046	〃
M21	XUC4FT	Stop Ring C4φ
M22	QBN1515	Connection Spring
M23	QBC1278	Head Spring
M24	QBP1773	Head Base Plate Pressure Spring
M25	QBN1656	Pressure Roller Spring
M26	QBN1481	Playback Spring
M27	QBN1480	Pause Lock Spring
M28	QBN1514	Timer Spring
M29	QBC1193	Safety Lever Spring
M30	QBN1513	Idler Spring
M31	QBP1723	Click Spring
M32	QBP1777	Holder Reinforcement Spring
M33	QXF0131	Flywheel Assembly
M34	QXH0239	Flywheel Retainer Assembly
M35	QDB0236	Capstan Belt
M36	QXL1136	Fast Forward Arm Assembly
M36-1	QBN1517	Fast Forward Spring
M36-2	QBN1559	Fast Forward Arm Spring
M36-3	QMC0080	Collar
M37	QML3040	Cam Lever
M38	QXD0067	Takeup Reel Table Assembly
M39	QXD0084	Supply Reel Table Assembly
M40	QXL1055	Auto-Stop Lever Assembly
M41	QDG1096	Cam Gear
M42	QXG1026	Auto-Stop Gear Assembly
M43	QXL1037	Gear Lever Assembly
M44	QML3042	Auto-Stop Obstruction Lever
M45	QML3217	Pause Lever
M46	QML3295	Cue Lever
M47	QML3124	Lock Release Arm
M48	QXR0275	Lock Rod Assembly
M49	QXR0470	Pause Rod Assembly
M50	QXR0343	Record Rod Assembly
M51	QXR0344	Playback Rod Assembly
M52	QMR1624	Rewind Rod-A
M53	QMR1623	Fast Forward Rod-A
M54	QMR1622	Stop Rod-A
M55	QMR1621	Eject Rod-A
M56	QML3038	Switch Arm
M57	QDB0240	Counter Belt
M58	QXC0036	Tape Counter
M59	QXA0649	Counter Angle
M60	MMC6A2HYA	DC Motor
M61	QMA3414	Motor Angle
M62	QXP0572	Motor Pulley Assembly
M63	QXR0345	Sub Eject Rod Assembly
M63-1	QBT1619	Idler Spring
M64	QML3206	Muting Arm
M65	QML3207	Muting Lever
M66	QXG1031	Damper Gear Assembly
M66-1	QDG1102	Holder Gear
M67	QMR1628	Obstruction Rod-A
M68	QMR1629	Obstruction Rod-B
M69	QBP1770	Obstruction Rod Spring
M70	QML3287	Brake Lever
M71	XTN26+6B	Screw ⊕2.6×6
M72	XTN3+25B	Screw ⊕3×25
M75	XSN26+4	Screw ⊕2.6×4
M76	QXK2153	Upper Base Plate Assembly
M80	QXK2149	Lower Base Plate Assembly
M81	QBN1555	Pause Lever Spring
M82	QBP1664	Operation Rod Spring
M83	QBN1531	Lock Release Arm Spring
M84	QBP1662	Lock Rod Spring
M85	QBT1682	Lock Holding Spring

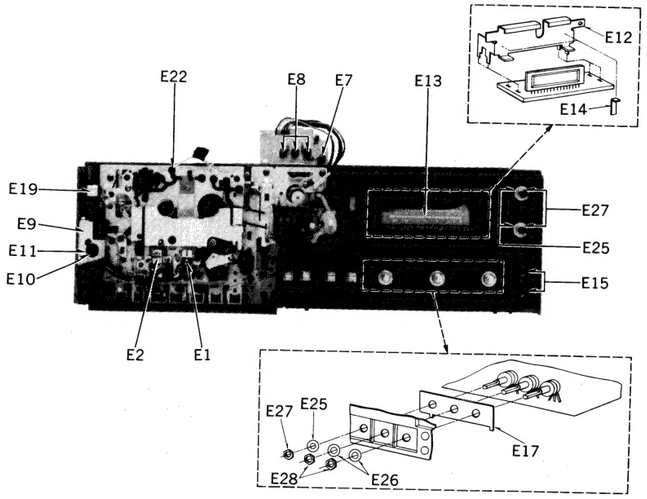
SPECIFICATIONS

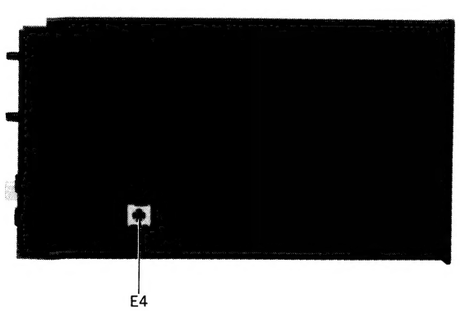
Pressure of pressure roller	350±50 gr
Takeup tention (Use cassette torque meter ··· QZZSRKCT)	50±15 gr-cm
Wow and flutter (Test tape ··· QZZCWAT)	Less than 0.07% (WRMS)

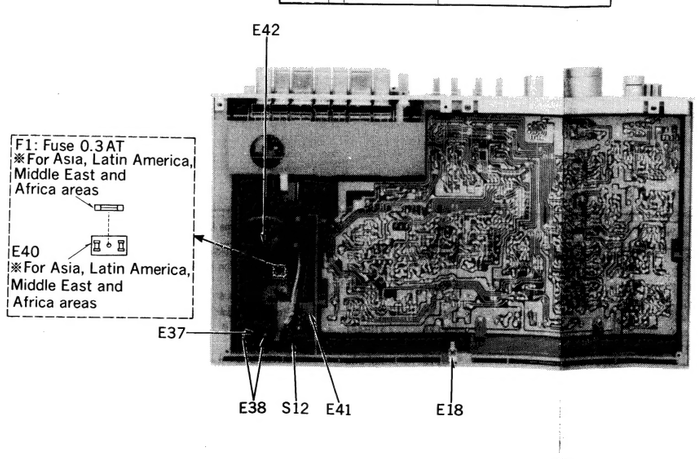
Ref. No.	Part No.	Part Name & Description
M86	QBN1574	Brake Spring
M87	QBC1344	Back Tension Spring
M88	QMD0016	Rewind Brake Cam
M89	QBT1833	Brake Cam Spring
M90	QML3205	Connection Lever
M91	QBS1119	Connection Wire
M92	QBW2018	Poly Washer
M93	QMF2009	Motor Sheet
M94	QMP1441	Motor Collar
M95	QXL1258	Memory Selection Lever
M96	QBN1542	Selection Lever Spring
M97	QBN1543	Reset Reinforcement Spring
M98	QMA3732	Switch Angle
M99	XTN26+4B	Screw ⊕2.6×4
M100	XSN3+5S	Screw ⊕3×5
M101	QML3484	Playback Switch Arm
M102	QXL1277	Erase Head Holding Plate
M103	XSN2+5	Screw
M104	QXH0310	Back Tension Plate
M105	QBT1872	Erase Head Spring
M106	QBC1343	Erase Head Holding Plate Spring
M107	QMA3806	Head Protection Angle
M108	QTD1273	Clamper
M109	XTN26+4B	Screw ⊕2.6×4
M110	XUC15FT	Stop Ring 1.5φ
M111	XUB4FT	Stop Ring C4φ
M112	QBW2012	Washer
M113	XSS26+4	Screw ⊕2.6×4
M114	XSN2+5	Screw ⊕2×5
M115	XWG2B	Washer
M116	QBN1699	Earth Spring

ELECTRICAL PARTS LOCATION





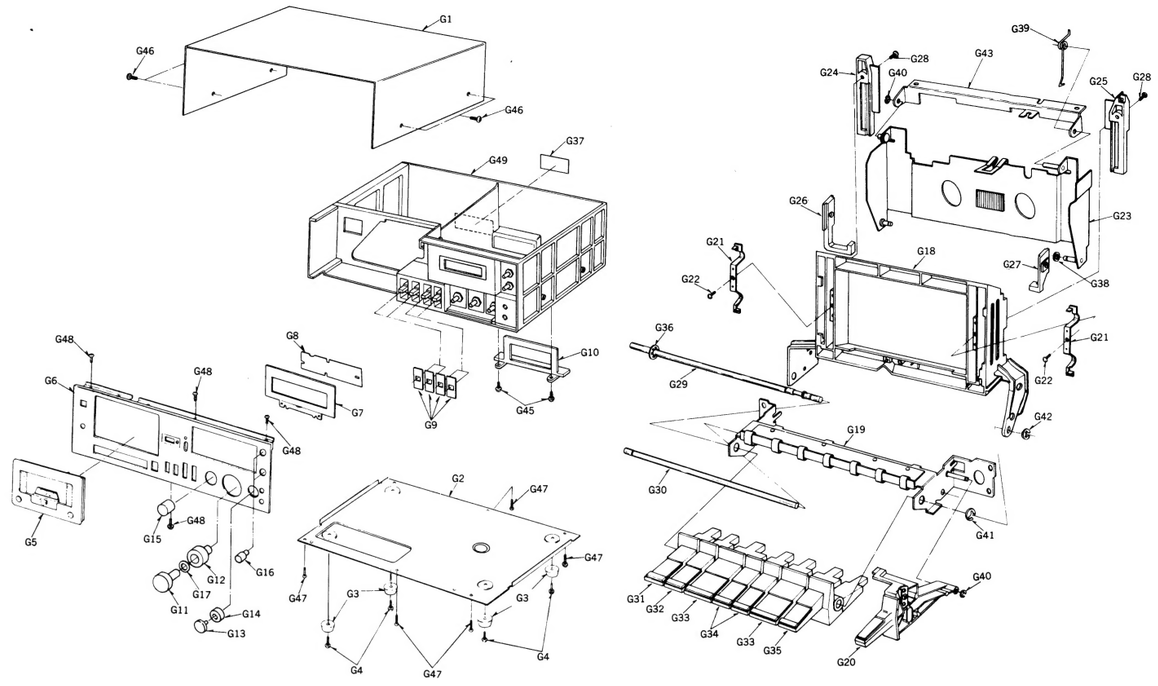




NOTE: ⚠ indicates that only parts specified by the manufacturer be used for safety.

Ref. No.	Part No.	Part Name & Description
		ELECTRICAL PARTS
E1	WY1403WA	Combination Head (Record and Playback)
E2	QWY2137Z	Erase Head
E3	QMLM0037	Record Lever
E4	QTSM0027	Earth Plate-A
E5	XUC3FT	Stop Ring 3φ
E6	Ⓓ ⚠ QFC1204M	AC Power Cord
	※For All European areas except United Kingdom.	
	Ⓑ ⚠ QFC1205M	"
	※For United Kingdom.	
	Ⓝ ⚠ QFC1203M	"
	※For Asia, Latin America, Middle East and Africa areas.	
	Ⓐ ⚠ QFC1208M	"
	※For Australia.	
E7	QBG1649	LED Spacer-A
E8	QBG1650	LED Spacer-B
E9	QMAM0116	Headphones Jack Angle
E10	QJA0249C	Headphones Jack
E11	QNQ1070	Nut
E12	QMAM0117	Meter Holding Angle
E13	QSLS002RF	Fluorescent Meter
E14	QBM1251	Cushion
E15	QJA0257H	Microphone Jack
E16	QEJ5002S	Jack Board Assembly
E17	QTSM0028	Earth Plate-B
E18	QTSM0029	Earth Plate-C
E19		
	ⒹⒷⒶ QXB0600	Push Button Assembly "Silver Type"
	※For All European areas and Australia.	
	Ⓓ QXB0600K	" "Black Type"
	※For All European areas except United Kingdom.	
	Ⓝ QXB0558	" "Silver Type"
	※For Asia, Latin America, Middle East and Africa areas.	
E20		
	ⒹⒷⒶ QBJ1425	Cord Bushing
	※For All European areas and Australia.	
	Ⓝ QTD1129	"
	※For Asia, Latin America, Middle East and Africa areas.	
E21	QBSM0003	Record Wire
E22	XAMQ34S600W	Pilot Lamp
E23	QTSM0030	Earth Plate-D
E24	QTTM011	Transformer Holding Plate
E25	XWS8AW	Washer
E26	QWQ1133	"
E27	XNS8	Nut
E28	XNS9	"
E29	QJT1054	Contact
E30	QJP1921TN	3 Pin Post
E31	QJP1922TN	6 Pin Post
E32	QJT0055	Connector
E33	QMS1306	Fast Forward Lever Shaft
E34	XTN4+12B	Screw ⊕4×12
E35	QJS1921TN	3 Pin Housing
E36	QJS1922TN	6 Pin Housing
E37		
	ⒹⒷⒶ QTD1164	Cord Clamper
	※For All European areas except United Kingdom.	
E38	XTN3+16B	Screw ⊕3×1.6
E39	ⒹⒷ QTF1039	Fuse Holder (4P)
	※For All European areas.	
E40	Ⓝ QTF1056	Fuse Holder (1P)
	※For Asia, Latin America, Middle East and Africa areas.	
E41	QMAM0118	Switch Angle
E42	QJT4017	Terminal Plate

CABINET PARTS



Ref. No.	Part No.	Part Name & Description
		CABINET PARTS
G1	QGCM0025 "Silver Type"	Case Cover
	QGCM0025K "Black Type"	"
G2	QGCM0026	Bottom Case
G3	QKA1050	Rubber Foot
G4	XTN3+10B	Screw ⊕3×10
G5	QYF0369 "Silver Type"	Cassette Lid Assembly
	QYF0399 "Black Type"	"
G6	QYPM0035 "Silver Type"	Front Panel Assembly
	QYPM0035K "Black Type"	"
G7	QGKM0120 "Silver Type"	Meter Cover-A
	QGKM0120K "Black Type"	"
G8	QKJM0029	Meter Cover-B
G9	QGK9299	Switch Mask
G10	QKJM0027 "Silver Type"	Jack Board Mask
	QKJM0027K "Black Type"	"
G11	QYT0488 "Silver Type"	Volume Knob-A
	QYT0526 "Black Type"	"
G12	QYT0489 "Silver Type"	Volume Knob-B
	QYT0527 "Black Type"	"
G13	QYT0534 "Silver Type"	Volume Knob-C
	QYT0552 "Black Type"	"
G14	QYT0535 "Silver Type"	Volume Knob-D
	QYT0553 "Black Type"	"
G15	QYT0536 "Silver Type"	Volume Knob-E
	QYT0551 "Black Type"	"
G16	QGT1460 "Silver Type"	Volume Knob-F
	QYT0529 "Black Type"	"
G17	QBW2066	Spacer
G18	QKF6008	Cassette Holder
G19	QXA0637	Push Button Holding Angle
G20	QXB0556 "Silver Type"	Timer Button Assembly
	QXB0655 "Black Type"	"
G21	QBP1771	Holder Spring
G22	XTN26+5B	Screw ⊕2.6×5
G23	QXH0271	Chassis Cover Assembly
G24	QKF6010	Holder Piece-L
G25	QKF6009	Holder Piece-R
G26	QMG0050	Holder Slider-L
G27	QMG0049	Holder Slider-R
G28	XTN26+8B	Screw ⊕2.6×8
G29	QMN2240	Push Button Shaft-A
G30	QMN1861	Push Button Shaft-B
G31	QGO1473 "Silver Type"	Push Button (PAUSE)
	QGO1551 "Black Type"	"
G32	QGO1474 "Silver Type"	Push Button (RECORD)
	QGO1552 "Black Type"	"
G33	QGO1476 "Silver Type"	Push Button (PLAY, STOP)
	QGO1554 "Black Type"	"
G34	QGO1477 "Silver Type"	Push Button (FF, REW)
	QGO1555 "Black Type"	"
G35	QGO1475 "Silver Type"	Push Button (EJECT)
	QGO1553 "Black Type"	"
G36	QNQ1080	Stop Ring
G37	Ⓓ QGSM0100	Main Name Plate
	※For All European areas except United Kingdom.	
	Ⓑ QGSM0102	"
	※For United Kingdom.	
	Ⓝ QGSM0103	"
	※For Asia, Latin America, Middle East and Africa areas.	
	Ⓐ QGSM0102	"
	※For Australia.	
G38	QBW2017	Washer
G39	QBN1554	Chassis Cover Spring
G40	XUC25FT	Stop Ring 2.5φ
G41	XUC4FT	Stop Ring 4φ
G42	XUC3FT	Stop Ring 3φ
G43	QMA3186	Fulcrum Angle
G45	XTW3+10B	Screw ⊖3×10
G46	XTN4+10B	Screw ⊕4×10
G47	XTW3+10B	Screw ⊖3×10
G48	XTN3+8B	Screw ⊕3×8
G49		
	ⒹⒷⒶ QYMM0057 "Silver Type"	Main Case Assembly
	※For All European areas and Australia.	
	Ⓓ QYMM0057K "Black Type"	"
	※For All European areas except United Kingdom.	
	Ⓝ QYMM0058 "Silver Type"	Main Case Assembly
	※For Asia, Latin America, Middle East and Africa areas.	
	ACCESSORIES	
A1	RP023A	Connection Cord
A2	QFTC30S011TZ	Demonstration Tape
A3	Ⓝ QJP0603S	AC Plug Adaptor
	※For Asia, Latin America, Middle East and Africa areas.	
A4	Ⓓ QQT2574	Instruction Book
	※For All European areas except United Kingdom.	
	ⒹⒷⒶ QQT2591	"
	※For United Kingdom and Australia.	
	Ⓝ QQT2592	"
	※For Asia, Latin America, Middle East and Africa areas.	
	PACKINGS	
P1	QPNM0144	Inside Carton
P2	QPAN0036	Cushion-L
P3	QPAN0037	Cushion-L